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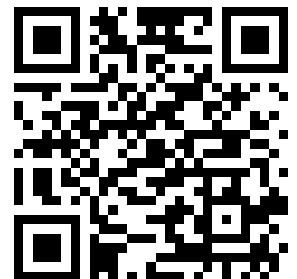
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# SOUND WAVES

VOL. XI  
No. 1

AN ADVOCATE OF  
INDEPENDENT TELEPHONY

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DECEMBER,  
1905  
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Published Monthly by THE THOMAS H. WILSON CO., Logansport, Indiana

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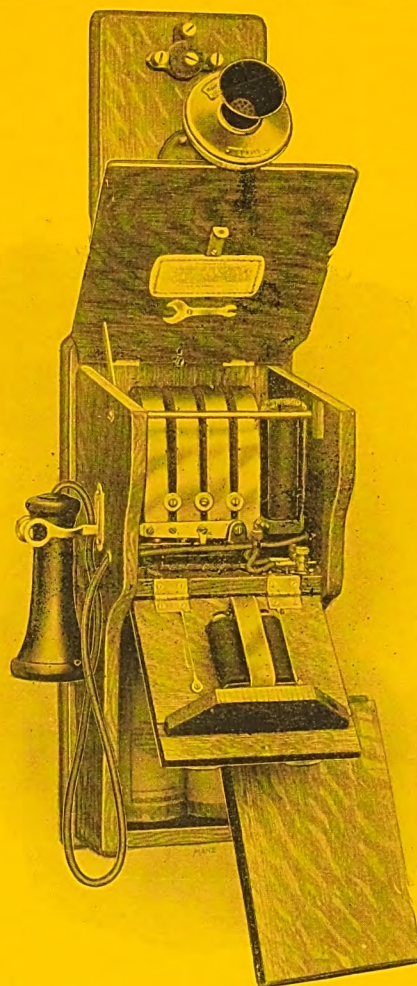




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# SOUND WAVES

A Monthly Magazine Devoted to the Interests of Independent Telephony

Vol. XI. DECEMBER, 1905 No. 1

## SOUND WAVES

PUBLISHED MONTHLY AT LOGANSFORT, IND., U. S. A. PRICE FIFTY CENTS A YEAR

Entered as second-class matter July 14, 1903, at the Post Office at Logansport, Indiana, under Act of Congress of March 3, 1879.

Wilson, Humphreys & Co., Logansport, Indiana, Proprietors and Publishers

W. A. TAYLOR, Technical Editor. . . . . 1362 Monadnock Bldg., Chicago  
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Telephone, Logansport Office, Black 441

Telephone, Chicago Office, Harrison 1521, Chicago Telephone Co.

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New Advertisements can be inserted if received by the 20th of each month, but to insure proper classification they should be in this office by the 15th.

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Subscriptions, Etc.—Address the Chicago Office. In sending personal checks for books or subscriptions, include 15 cents for exchange.

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## EDITORIAL COMMENT

All communications to the editorial or advertising departments of this paper, answers to want advertisements, subscriptions, etc., should be sent to the Chicago office, addressed plainly to **SOUND WAVES**, 1362 Monadnock Bldg., Chicago, Ill. Subscribers and others will confer a favor and facilitate the work of this paper by complying with the above request. Technical and news contributions will receive prompt attention and are respectfully solicited.

## THE NEED OF TRAINED HELP.

The growth of the telephone business has been so great that it has been very hard to get efficient help to keep the work going in as good a manner as is desirable. The consequence of the rapid growth has been that workmen wholly unfit have been hired to do the work that only skilled men should attempt. It would be hard to estimate just how many thousand dollars have been lost because of improper attention. It is getting so that anybody who can hang an electric door bell signs himself an "expert."

The manufacturer hears from some company who has bought his telephones that they have had an expert examine the lines and the decision has been that the telephones are "No good." The 'expert' has probably never done any work but the installing of door bells and his word is taken against that of a company that employs the most skilled engineers.

It is not necessarily the smaller companies that suffer from incompetent help, but some of the largest systems have been so affected. Not more than four years ago, one of the largest exchanges in the country had to have the factory expert show them that the trouble with the switchboard was from dirt that had been allowed to accumulate in the parts. In another exchange of over five thousand subscribers, the underground cables were allowed to go to ruin from electrolysis, even after the engineer had been warned. These two cases of incompetence came from the heads of the departments holding their places from pulls.

Of course there will always be inefficient help in any line of work, but it should be kept reduced to its lowest limit. A telephone system should be run in just as business like a manner as any other investment. Unfortunately, those who invest, for the most part do not know anything about the practical end of the business and they have to take the word of somebody who claims that he knows. Here is where the real trouble lies.

It is easy to keep books and to know just exactly what expenditures have been made, and this should be done. It should not be done in a general way but everything should be accurately itemized. The officers should study these accounts and arrange to compare results with other systems. Draw the deadly parallel

between the different exchanges and consult with each other. It will then not be hard to find out where economies may be effected. The making of daily reports by the workmen is a positive necessity. No honest man can consistently object to giving an account of his time.

The employer who can not hire the best of help should see to it that this help shall make fair progress. A green man who never reads a telephone book or periodical, will not make a good workman in a thousand years.

There are good correspondence schools that will give all that the student will permit them. So there is no excuse for anybody to remain ignorant. Every manufacturing company is anxious to give information to its patrons.

So far, there has not been very much inducement for the college man to enter the telephone field for the financial returns have not been promising. The difficulty will probably be changed before long for the advantage of the skilled help of the engineer will be better appreciated.

It was not very long ago that a certain large company with two million dollars behind them, wanted a high grade engineer to take entire charge of their system. They offered fifteen hundred dollars a year. They didn't get the man. They got a man.

The time is coming when no Independent company can rely wholly upon the sympathy of the home people. The public is much inclined to forget all about the grinding monopoly, and trade with the people that will give them the most for their money, if one company will not give them what is wanted, the other will. The very latest conveniences for increasing the speed of the services will have to be provided at a considerable expense. Rates will be a little higher than now, but they will still be so low that there will have to be economy at every point in order to declare a dividend. The exchange must be run on strictly business principles, just as much so as a bank, or other institution.

A word should also be said about the operator. In most exchanges, the operator has an easy time. She knows every person in town and is known of them. She is apt to fall into the habit of visiting over the lines and soon she will make the calling subscriber wait till she finishes her conversation. Then perhaps she will forget to answer till he calls again. The caller will be out of patience and will say so. The operator will sauce him, and then the man will go over to the other company, and try and persuade his friends to do the same.

Some operators will be surprised to learn that in the larger exchanges, that are well conducted, any operator caught talking to the one next to her or to any subscriber, except on business, is subject to instant dismissal. This is hard, to be sure; but it would be impossible to run the exchange otherwise.

Of course such discipline is not so necessary in the smaller exchanges, but it should be insisted upon that all operators shall be courteous at all times regardless of what is said to them. All subscribers who show a quarrelsome disposition should be turned over to the manager or other officer whose duty it is to take care of complaints. The operator should be instructed to attend to business strictly and let their friends call them after business hours.

Remember that the success of the exchange depends upon the employe; he can make you or break you; therefore it behooves you to look well to the help. Make it an object for the men and operators to work in the interests of the company.

### "BELL" MISREPRESENTATION.

Permit me to make a few observations bearing on the warped statements by the Bell Telephone Co. which are going the rounds of the press at so much per line. Just now the burden of their song is that Independents do not provide for depreciation, that they are over-capitalized, that the rates they are receiving for telephone service are below the cost of operation. To lend force to their argument they point to Fort Wayne, Ind., because the writer, who is acting as secretary of the Fort Wayne company, in his report of 1904 to the State Board of Taxation lent his efforts (just as the Bell did on the same day) to avoid undue assessment. If then their representation as it pertains to Fort Wayne falls flat, since they make it the basis of their article, necessarily the entire argument must lose all force and appear what it is—an effort to mislead the investing public.

The "handwriting on the wall" has been very legible to the Bell for some time, hence their frantic efforts to check the onward march of the Independents which gains in volume daily.

The Bell says rates are below the cost of operation—taking depreciation into account.

Independent rates in Fort Wayne—Business..\$36.00

Independent rates in Fort Wayne—Residence.. 24.00

Independent telephones in service ..... 3,500

Bell rates—Business ..... \$24.00

Bell rates—Residence .... 10.00

Bell telephones in service ..... 400

(Verify this by applying to any local banker, jobber or commercial agency.)

By the Bell's argument they must be doing a losing business. Before the advent of the Independent company, Bell rates were, for business \$48 to \$60; residence \$36 to \$48.

The article states that promoting companies have dumped the Independent securities on local people to the latter's regret. The bonds issued by the Independent company of Ft. Wayne are selling in the market at 6 per cent above par—the stock has gained 30 points during the last year and not a share is offered for sale by holders. (Verify this by asking any local banker, merchant or commercial agency.) Stock dividends have been paid uninterruptedly for nine years. During this period the company has bought, paid for and erected the buildings it occupies at a cost of \$40,000, enlarged an extensive underground system, rebuilt and installed a modern and new plant throughout. The Central Union owns no real estate and uses the old system. By the way, how has the market value of Central Union Telephone Co. stock fared since 1895, and also how many dividends have been declared? The answer will give food for thought.

Over capitalization is another item given. In a previous article I have shown by the U. S. Government report that the Bell capitalization is nearly two and one-half times greater per unit than the Independents, and only recently it came under my personal observation that in two neighboring towns their capi-

talization per telephone reaches over \$200. The prolific penman of the Bell persuasion often makes a bad mess of the articles for which his company pays so much per line.



### MR. DAGGER COMPLIMENTS US.

F. Dagger, technical expert for the commission appointed by the Canadian parliament to investigate and report upon telephone conditions in Canada and elsewhere with a view to the improvement of the telephone service in Canada, recently visited the United States. He stopped a day or so in Chicago, and went on to Aurora, Plainfield, Joliet and Peoria, where he pursued his investigations among the Independent exchanges. During a part of his stay he was the guest of President Conklin, of the Inter-State Independent Telephone & Telegraph Company, and visited the several exchanges of that company in the cities last mentioned.

Mr. Dagger declared that he was much surprised at the wonderful service secured for the telephone users in this country as compared with that given in Canada. In the rural districts, especially, he found that among every five or six persons in the rural communities of this state there is one supplied with a telephone, a condition of affairs that absolutely cannot be compared with the Canadian service.

Competition is at the bottom of this advancement, according to Mr. Dagger, and its absence is what has resulted in the backwardness of the industry in Canada. Mr. Dagger stated that the idea of government control of telephone companies entered to a great extent into the agitation that is now aroused in Canada regarding the subject. He stated that the great success of the Municipal Telephone Company operated at Port William and Port Arthur, the two Canadian cities at the head of Lake Superior, is proof that with competition, whether municipal or otherwise, the telephone service is bound to improve.

### DECLARES LOCAL EXCHANGE A MARVEL.

When the Bell company established its lines in these cities they secured altogether in the neighborhood of 250 subscribers. During recent years conditions became so intolerable in the cities that a municipal exchange was started. Mr. Dagger asserted that last January the new municipal exchange had altogether about 1,200 subscribers in both cities while the Bell's patronage had fallen to only 100. He mentioned this as showing that a municipal exchange will readily be supported by the people.

Whether or not the Canadian government will assume control of the telephone lines to any extent depends largely upon the findings of the committee, but Mr. Dagger stated that at present sentiment among the Canadian population seems to be in favor of it. In connection with his visit in this state, and particularly in Springfield, Mr. Dagger stated that he was greatly surprised at the wonderfully smooth way in which the service was operated. The local exchange of the Inter-State company he declared to be simply a marvel. He declared that in all his long experience in Great Britain, Canada and his visits to this country, he had never before been in such a quiet and well conducted switch room. The swift way in which

all calls were answered and at the same time the great quiet prevailing in the room, according to Mr. Dagger, showed the very acme of efficiency in telephone service, and he thought it would be impossible to improve upon it.

The Canadian postmaster general, Sir William Mullock, recommended Mr. Dagger for the place of expert adviser on the commission because of his great experience in telephone matters, and the recommendation was accepted. Mr. Dagger was connected for nineteen years with the National Telephone Company in Great Britain, and after coming to Canada, in 1899, he continued his researches on that subject.

### OFFICIAL BULLETIN NUMBER FIVE

THE NATIONAL INTER-STATE TELEPHONE ASSOCIATION,  
GENERAL HEADQUARTERS.

#### MAPS.

Maps of Indiana, Michigan, Missouri and Pennsylvania have been almost completed. We had hoped to finish one or more of these in time for publication this month, but the tardiness of a number of companies in furnishing data requested has made this impossible. We expect to finish these, and a number of other State maps during the coming month. Complete map of Ohio will be ready for general distribution on or about December 20th.

We must again urge Independent companies to be more prompt in responding to our request for map data. It will be impossible for us to compile maps of the various states without the co-operation of the Independent companies who operate toll lines.

#### EXECUTIVE COUNCIL.

Mr. C. E. Wilson, general manager of the Keystone Telephone Company, Philadelphia, Pennsylvania, has been appointed a member of the Executive Council to succeed the late Mr. W. D. Barnard. A meeting of this council, to be held in the office of the president at Cleveland, Ohio, has been called for November 24th. A list of committees appointed, and a report of other matters considered at this meeting, will be given in the next bulletin.

#### COMMITTEE ON LITIGATION AND LEGISLATION.

This committee will hold a joint meeting with the Executive Council on November 24th.

#### WARNING TO INDEPENDENT TELEPHONE COMPANIES.

During the past six weeks the association's attention has been called several times to circular letters which are being sent out in a number of the states by individuals and corporations representing themselves as promoters for Independent Telephone Companies or Combinations. All Independent companies receiving such letters are warned against giving out information regarding their plants without first satisfying themselves that it is not being furnished to irresponsible parties, and that it will not be used in any way to the detriment of the Independent telephone movement.

#### AN INDEPENDENT SLOGAN.

It has been suggested by a number of prominent telephone men that the Independent companies of the country on all future directories print the phrase, "LOOK FOR THE SHIELD," in quotation marks as here shown, and also use this in their other advertising. This is already being done by a number of the companies in various states. The idea is to make this phrase distinctive in Independent advertising. The association merely submits this for the consideration of its members.

# Sound Waves Prize Contest



- ¶ This paper will give a number of cash prizes for the best articles on several subjects.
- ¶ We make this offer to encourage our readers to commit their ideas to writing for their own good and the good of others in the field. Without doubt many of our readers not known to us have ideas whose presentation in these columns might start movements of far-reaching benefit to the Independent telephone cause. This interchange of ideas often leads to incalculable benefits, as the "missing link" in one's investigations may thus be discovered.
- ¶ For the present, prizes will be given on three subjects:
- ¶ First, Telephone Exchange Accounting. Prize \$30. This article must not be less than 5,000 words long and must apply to exchanges having 1,000 telephones and less.
- ¶ Second. Best Methods of Increasing Exchange Business. Prize \$20. This article must contain not less than 4,000 words nor more than 6,000 words.
- ¶ Third. Suggestions for the Equitable Division of Toll Receipts Between the Toll Line Company and the Exchange. Prize \$15. Article should contain not less than 2,000 nor more than 5,000 words.
- ¶ In the judgment of manuscript the following points will govern:
  1. General merit or worth. 2. Originality. 3. Clearness. 4. Conciseness.
- ¶ Each article, if necessary to the proper elucidation of the ideas, should be accompanied by suitable diagrams and forms, presented in such shape that they may be reproduced by photographic process without having to be redrawn. That is to say, diagrams, etc., must be well and neatly drawn with black ink on white paper. If photographs are sent they should be sufficiently large to permit of considerable reduction and must be clear and sharp in all details and not too dark in tone. Any printed matter conforming to above can be reproduced and will be acceptable as an illustration, provided, of course, that there is not too much of it and that the type is such as to permit of whatever reduction may be necessary to conform to our established page or column width. For instance, a nonpareil line seven inches long would not be very legible if reduced to three and one-quarter inches. Writers must take such points into consideration and will be expected to use good judgment in these particulars.
- ¶ We shall offer other prizes in the near future, wherein writers will be free to select their subjects within the limits of the operating field and will not meet previous writers in the competitive test.
- ¶ All manuscript is to be presented not later than January 10th, and should be signed with a nom de plume. Accompanying the manuscript, there should be an envelope having the writer's nom de plume on the outside and his true name and address sealed within.
- ¶ All manuscript shall be plainly marked "FOR SOUND WAVES PRIZE CONTEST."
- ¶ After having received the manuscripts of all those competing, a committee of three disinterested judges will carefully examine all articles submitted.
- ¶ Mr. James B. Hoge, President of the National Interstate Telephone Association, will appoint the judges. If in the opinion of the judges, none of the articles are deemed worthy of a prize, none will be given. If, on the other hand, there are several meritorious contributions on the same subject, SOUND WAVES will be pleased to publish them and pay for them.
- ¶ Do not hesitate simply because you think that your English is not perfect. We are after good ideas and if you can express them in effective words, our grammarian will take care of the rest before publication. There are many of the best telephone men in the world who can not clothe their thoughts in the most approved English, but they are strong writers just the same.

# Pennsylvania Independent Meet

The annual meeting of the Pennsylvania Independent Telephone Association was held on November 9 and 10, at the Monongahela House, Pittsburg. The local host of the occasion was the Pittsburg & Allegheny Telephone Company, one of the largest Independent concerns in the state. The following officers were elected for the ensuing year:

President, C. W. Kline, Hazelton, president of the Consolidated Telephone Company of America; first vice president, Charles Griffith, president of the Johnstown Telephone Company; second vice president, James Collins Jones, of the Keystone Telephone Company, Philadelphia; secretary, H. E. Bradley, secretary of the East-



H. E. BRADLEY

ern Traffic Association, Philadelphia; treasurer, C. E. Wilson, Philadelphia, general manager of the Keystone Telephone Company. The executive committee for the ensuing year is composed of the following gentlemen: Edward Davis, Philadelphia; R. E. Umbel, Uniontown; W. B. Trast, Erie; F. D. Houck, Harrisburg; C. E. Wilson, Philadelphia; Charles West, Allentown; E. D. Schade, of Johnstown, and G. B. Rudy, York.

The morning was devoted to a meeting of the executive committee, at which the following committees were named: Nominations, C. E. Wilson, Charles West and J. G. Splane. Credentials, Charles Berg, Frank Hart and S. G. Latta. Resolutions on death of First Vice President W. D. Barnard, of Philadelphia, John S. Weller, Charles Russell and E. D. Schade. Program, Frank Hart, C. E. Wilson and H. E. Bradley.

Vice President Charles Griffith presided at the afternoon session. The address of welcome delivered by Assistant City Solicitor John A. Blair, on behalf of the

mayor, was responded to by ex-Senator John S. Weller, vice president and general counsel of the Pittsburg & Allegheny Telephone Company. Reports were made by some committees, and the election of officers followed.

In the report made by Secretary Bradley it was shown that there are fifty organized operating Independent telephone companies in Pennsylvania, and all are allied with the association. There are in all eighty-three Independent telephone concerns in the state, but a considerable number are very small. The companies allied with the association operate 75,899 telephones and 71,142 miles of toll circuits, covering practically the entire state.

In reply to a question Secretary Bradley stated that the purpose of the association is not to bring the many Independent companies into one concern financially, but to put into effect throughout the association's constituent companies uniform conditions which will make all the companies a uniform operating system. For this purpose the state has been divided into five districts. A traffic committee has supervision of the task of working the companies throughout the state into an operating unit.

During the second day's session the discussion of business was continued. The Federal Telephone Company, which operates in Washington county, was denounced as not being a genuine Independent concern. A resolution was introduced by C. E. Wilson, of the Keystone Telephone Company, of Philadelphia, the substance of which was that the Federal was allied directly or indirectly with the Bell interests, and was not, strictly speaking, an Independent concern. It was adopted. A suitable resolution was adopted on the death of W. D. Barnard, of Philadelphia, late first vice president of the association.

## FIRST SESSION

The first session of the convention—that of November 9—was devoted to the address of welcome and the response by Mr. Weller, report of the committee on credentials and of the committee on nominations, and the election of officers for the ensuing year.

On the following morning the meeting was called to order at 11:15, Vice President Griffith presiding. Mr. Weller, as chairman of the committee on resolutions on the death of Vice President Barnard, reported for the committee as follows:

WHEREAS, It has pleased Divine Providence to remove from our midst and from his earthly labors, William D. Barnard; and

WHEREAS, His skill and efforts in the field of Independent telephone development distinguished him as one of the foremost men in his profession; therefore,

Resolved, That the Pennsylvania State Independent Telephone Association, in convention assembled, give expression to the great loss it and the Independent telephone industry generally have sustained in the death of our colleague and co-worker, whose qualities of heart and mind endeared him to all who came in contact with him.

Resolved, That in William D. Barnard we found all the attributes of good citizenship, the successful man in the public affairs with which he was identified; in private life all the sterling qualities of a God-fearing, home-loving, public spirited, manly man.

*Resolved*, That his skill and energy in the Independent telephone field and his clean private life have erected for him in the hearts of his associates a monument more enduring than words and more lasting than any tablet that can be erected by mankind.

*Resolved*, That the loss to the Independent telephone industry is irreparable, the loss to his friends and family the greatest they could sustain and we, the members of this association surviving, tender our condolence to the bereaved family and direct that a copy of these resolutions be forwarded to the family of the deceased."

The above resolutions were unanimously adopted, were directed to be spread upon the minutes of the meeting and a copy sent to the family of the deceased as provided in the resolution.

Following the passage of the above resolutions, Mr. West, of Allentown, was introduced and read his paper, which appears elsewhere in this issue.

Following Mr. West's paper, the chairman introduced Mr. J. Walter Barnes, of Fairmount, W. Va., who spoke on the conditions existing in his state with relation to the situation in Pennsylvania.

Mr. J. G. Splane, of the P. & A. Telephone Company, spoke in a spirited vein concerning the development of the Pittsburg district, and expressed himself optimistically with regard to the prospect of inter-communication between all existing Independent companies and Independent toll line companies.

Professor Kelsey, of Chicago, expressed the view that the Independent people will all eventually come to the measured service basis. This view was not concurred in, however, by some of the members, who thought that a combination of the flat rate and the measured service idea is the most practical—flat rates for individual lines and measured service for party lines. Unlimited service over one wire for more than one subscriber was pronounced to be impractical.

Mr. Edward Davis, of Philadelphia, urged the members not to be frightened by the long distance bug-a-boo. Such a small percentage of the service of the average exchange consists of long distance messages that an exchange can grow and prosper even without long distance advantages. Other members who spoke expressed the view that Mr. Davis was mainly right, but that the long distance service is a valuable adjunct with which to meet the Bell arguments along this line. Mr. C. E. Wilson, of Philadelphia, expressed practically this view, concurring in the main with Mr. Davis. He said that while we all recognize the long distance as a necessity, the absence of it is no excuse for lack of growth; that an exchange can handle the volume of local business without the long distance facilities provided the exchange is able to give good local service. He urged that for new companies flat rates are the best, for the opposition, being on a measured service basis, is instantly at a disadvantage when brought into competition with a flat rate and unlimited service. He advised getting the business 'phones first and then the residence 'phones, for otherwise a new company would be too long in getting its lines on a paying basis. He compared the flat rate, or unlimited service, with the same service given by street car companies, and showed the un wisdom of attempting this service with more than one subscriber on a line. People who want unlimited service are usually willing to pay for it; those who cannot must be content to go on a party line on a measured service basis. To attempt anything else is impractical, unprofitable and results in too much complaint on the part of subscribers.

Mr. Malin, of Clearfield, Pa., described the encouraging growth of his company in a short period of time against an established Bell opposition. Mr. William H. Wilson stated what his plant—the Union Telephone Company—had done in the northwestern counties of the state. He believed, also, that the principal point to be considered is an effective local service; toll service is desirable, but not essential in comparison to the first requisite of good local service. The Union company, he said, has developed the counties in which it operates in the face of the fiercest Bell opposition. They have gotten the farmers interested and have shown them how to build their lines; have let them build their lines and have given them connections, and in answer to the question, "Can we talk to Chicago, St. Louis, New York?" have replied, "How often do you want to talk to those places?" There is no use being afraid of the Bell bug-a-boo. Give good service and the long distance connections will come in due time.

Mr. Theodore White, of Baltimore, described conditions in his state; he believed that long distance service is the most important and profitable part of service and fairly essential in the proper development of the local field.

Mr. Fair, of Beaver, Pa., a former Ohio telephone man, described his difficulties in securing franchises in his district, and his nearly uniform final success in all his franchise campaigns.

Mr. William S. Paca, of Oil City, Pa., told of the work of his company in Oil City, Franklin, Titusville and Pleasantville. He expressed the view that the measured service proposition is impractical for the smaller sized cities and towns. Mr. Paca disagreed with previous speakers on the proposition of getting the business houses first; it had been his experience that the residence 'phones bring in the business houses as an inevitable result.

Mr. McCarty, of Pittsburg, urged that the construction of all plants be standardized.

Mr. Lee, of Washington, brought up the subject of the methods used by the Federal Telephone Company to thwart the efforts of the Independent companies in the district it covers. He described the methods pursued by this company and urged that the convention take action declaring that the Federal company is not an Independent concern. Mr. Hamlin, of Wheeling, made a statement concerning the tactics of the Federal company, describing in detail certain experiences he had had and certain interviews with Mr. DeLand of the Federal company. Mr. Hamlin declared that every act of the Federal company wherever he had come in contact with them, had been directly against the interest of the Independent movement. Mr. Wilson and others said that the Federal is but one of the many Bell subterfuges.

The upshot of the discussion was that the following resolution, presented by Mr. Wilson, was unanimously adopted:

"It is resolved by the members of the Pennsylvania State Independent Telephone Association, assembled in convention at Pittsburg, that the Federal Telephone Company of Pennsylvania, by their acts and deeds in every respect, relating to Independent telephone companies, have proven to our entire satisfaction, without the possibility of a doubt in our minds, that they are not an Independent in the true sense of the word, and that they are allied, directly or indirectly, with the Bell Company; and that their operations have tended to impede, rather than to assist, the development of the Independent interests. This resolution refers to the company which is controlled by Mr. Fred. DeLand and associates."



The passage of the resolution above was followed by a stirring talk by Secretary Bradley urging all Independent telephone men present to enroll themselves as members of the association. He spoke of the efforts of the Federal people to become members and told how the association turned them down. After some further discussion of the Federal Telephone Company matter, the convention adjourned.

The following is a list of those in attendance at the convention:

T. E. Hughes, Mgr. Sales Dept. Standard Underground Cable Co., 1220 Betz Bldg., Philadelphia, Pa.; J. C. Kelsey, sales engineer, Kellogg Switchboard & Supply Co., Chicago, Ill.; R. S. Mueller, Mgr. Cleveland sales Dept. Kellogg Switchboard & Supply Company, Cleveland, O.; Jno. F. Frasher, Gen. sales Mgr. Mountain States Elect. Co., Wheeling, W. Va.; L. W. Stanton, engineer, 411 Electric Building, Cleveland, Ohio; U. G. Tingley, Trick & Lindsay Company, 109 Wood street, city; W. J. Mooney, salesman Stromberg-Carlson Tel. Mfg. Co., Rochester, N. Y.; H. L. Parker, salesman for Penna. & Md. North Electric Co., Cleveland, Ohio; J. H. Parish, sales Mgr. (Philada. office) K. S. & T. Co., Chicago, Ill.; C. M. Thompson, P. G. I., Kellogg, Philadelphia, Pa.; J. W. Smyth, Jno. H. Roeblings Sons Co., 109-111 Wood street, Pittsburg, Pa.; Louis P. Schneider, right-of-way agent Pittsburg & Allegheny Tel., 27 So. 14th street, Pittsburg, Pa.; B. A. Llewellyn, Supt. installation, Pittsburg & Allegheny Tel. Co., Pittsburg, Pa.; W. B. Crawford, representative Stromberg-Carlson Tel. Mfg. Co., Rochester, N. Y.; Geo. B. Pratt, Ohio representative North Electric Company, Cleveland, Ohio; F. W. Pardee, Gen. Mgr. Frank B. Cook, 240 W. Lake St., Chicago, Ill.; A. J. Ulrich, traffic manager Keystone Tel. Co., of Philadelphia, 135 S. Second St., Philadelphia; W. D. Shaler, Doubleday Hill Electric Company, 919 Liberty Av., Pittsburg, Pa.; W. C. Handlan, general manager National Telephone Company, Wheeling, W. Va.; J. G. Ihmsen, general manager American Electric Telephone Co., Chicago, Ill.; H. B. McMeal, president and editor Telephony Publishing Co., Chicago, Ill.; Thos. G. Davis, Secy. and Asst. treasurer Pittsburg & Allegheny Tel. Co., Pittsburg, Pa.; J. W. Kenedy, president Home Mutual, Bealsville, Pa.; Chas. Phillip Hill, member of firm of Doubleday-Hill Electric Co., 919 Liberty Av., Pittsburg, Pa.; Edward Davis, 2nd vice president United Tel. & Tel. Co., 112 N. Broad St., Philadelphia, Pa.; H. S. Duran, salesman Automatic Electric Company, Chicago, Ill.; Julius Bernstein, representative The Leeds & Northrup Co., 259 N. Broad St., city; G. E. Livingstone, traffic manager Pittsburg & Allegheny Tel. Co., Pittsburg, Pa.; Morris Mead, special representative C. K. Hill Electric Co., Pittsburg, Pa.; Thos. W. Davis, Mgr. central sales Dept. Standard Underground Cable Co., Pittsburg, Pa.; T. B. Lee, superintendent State Mutual Telephone Co., box 589, Pittsburg, Pa.; John H. Reid, American Electric Telephone Company Mfg. Club, Philadelphia, Pa.; William S. Paca, general manager Petroleum Telephone Company, Oil City, Pa.; E. J. Moore, treasurer and manager Farmers' Telephone Co., Point Marion, Pa.; Chas. A. Berg, Gen. Mgr., Tri-State Telephone Co., Uniontown, Pa.; Chas. W. Bolinger, Mgr. Apollo Telephone Co., Apollo, Pa.; J. S. Eugh, Automatic Electric Co., Chicago, Ill.; Edwin D. Schade, Sec. and Gen. Mgr. Johnstown Telephone Co., Johnstown, Pa.; Chas. J. Mayer, treasurer Pittsburg-Johnstown Telephone Co., Johnstown, Pa.; Chas. Griffith, president Johnstown Telephone Co., Johnstown, Pa.; Frank Hart, Supt. L. D., Pittsburg & Allegheny Tel. Co., Pittsburg, Pa.; Theodore White, traffic manager Maryland Tel. & Tel. Co., Baltimore, Md.; A. H. Doudna, Gen. Mgr. Belmont Telephone Co., Bellaire, Ohio; S. G. Latta, V. Pres. and Gen. Mgr. Elk. Tel. & Tel. Co., Wilcox, Elk county, Pa.; O. S. Marshall, Supt. Armstrong Telephone Co., Rural Valley, Rural, Pa.; C. E. Wilson, Gen. Mgr. Keystone Telephone Co., 135 S. Second St., Philadelphia, Pa.; W. L. Malin, Gen. Supt. Huntingdon & Clearfield Te. Co., Clearfield, Pa.; Chas. West, Gen. Mgr. Consolidated Telephone Companies of Pennsylvania, Allentown, Pa.; O. Bruce Porter, engineer Huntingdon & Clearfield Telephone Co., Clearfield, Pa.; L. I. Long, Pres. and Mgr. Mt. Morse Telephone Co., Mt. Moris, Pa.; K. B. Schotte, Mgr. Kitanning Telephone Co., Kitanning, Pa.; N. W. Brooker, Jr., contract agent Pittsburg & Allegheny Tel. Co., Pittsburg, Pa.; F. A. Demarest, Gen. Supt. Inter-State Tel. Co., of New Jersey, Trenton, N. J.; Chas. F. Bender, auditor Pittsburg & Allegheny Telephone Co., Pittsburg, Pa.; W. C. Watson, Pres. Indiana Telephone Co., Indiana, Pa.; E. J. Graff, Secy. Blairsville Telephone Co., Blairsville, Pa.; W. H. Wilson, Gen. Mgr. Consolidated Telephone Co., Fairmount, W. Va.; W. Scarlett, engineer United Telephone & Telegraph Co., Harrisburg,

Pa.; E. C. McCarthy, Supt. of construction Pittsburg & Allegheny Telephone Co., Pittsburg, Pa.; H. W. Harmon, director Armstrong Telephone Co., Rural Valley, Rural, Pa.; J. Walter Barnes, Gen. Mgr. Consolidated Tel. Co., Fairmount, W. Va.

Members and officers were all interested in making the meeting a success and as a result the sessions were among the most interesting the association ever held. A number of notable papers and addresses were presented to the convention, one of which, that of Mr. West, of Allentown, on "The Future of the Independent Telephone Movement," is published in this issue. Other papers will be presented in succeeding issues as space permits.

Suitable resolutions of thanks were adopted, expressive of the association's appreciation of the courtesy of the press, and the hospitality extended by the Pittsburg & Allegheny Telephone Company, and the management of the Monongahela House.

Reports of the secretaries and of the treasurer showed that the association is growing in membership and that its finances are in a satisfactory condition. District reports indicated that the district plan of organization is an effective system. While there are but five districts in the state, each had shown a good record for work done and new members secured.

The feature of the closing day of the session was the banquet, which was held at the Monongahela House, with covers for more than 100. It was a strictly stag affair. The dinner was served in courses. The tables were laid in the form of a rectangle, with the toastmaster and the speakers at the lower end.

Every toast responded to was significant of the spirit of the Independents against the opposition. Some of the speakers mentioned the competing company by name, while others alluded to it in general terms, but all announced their determination to keep on fighting it, and all expressed belief that success would result. Former Senator Weller, who is vice president of the Pittsburg & Allegheny Telephone Company, was an admirable toastmaster. He knew his speakers in that he called upon the unprepared and surprised them into making some good talks, and he had a fund of capital stories that took but a short time in the telling. He made the stories fit the points the speakers were to make. Among those who responded were W. C. Watson, former president of the Indiana Independent Telephone Company, Indiana, Pa.; G. W. Beers, general manager of the Home Telephone Company, of Fort Wayne, Ind.; W. M. Brooker, Jr., contracting agent of the Pittsburg & Allegheny Telephone Company, of Pittsburg; Charles West, of Allentown, general manager of the Consolidated Telephone Company of Pennsylvania Messrs. Handlan and Barnes, of the National Telephone Company, of Wheeling, W. Va., and others.

The pope has adopted the telephone habit. The vatican is now as elaborately wired as any great financial institution or hotel in the United States—house, local and long-distance telephone in every room. The long-distance telephone most often used by the pope is the wire connection with Venice, his old place of residence and useful activity. From Venice come stories of all sorts of people who are occasionally called up by Pius for a moment's chat or some personal instruction.

Take Sound Waves—50 cents a year.

# Nebraska Independents Meet at Hastings

The Nebraska Independent Telephone Association met in Hastings November 14, in a special session on the call of the president, the object being a special consideration of the toll association and clearing house proposition for the state. Most of the members arrived early, but the president, W. E. Bell, of York, and others, arriving late in the afternoon; business was not commenced until their arrival. About 3:30 the assembly was called to order by President Bell. The secretary being absent, Mr. Mattison, of Lincoln, was elected secretary to act until the state meeting in January.

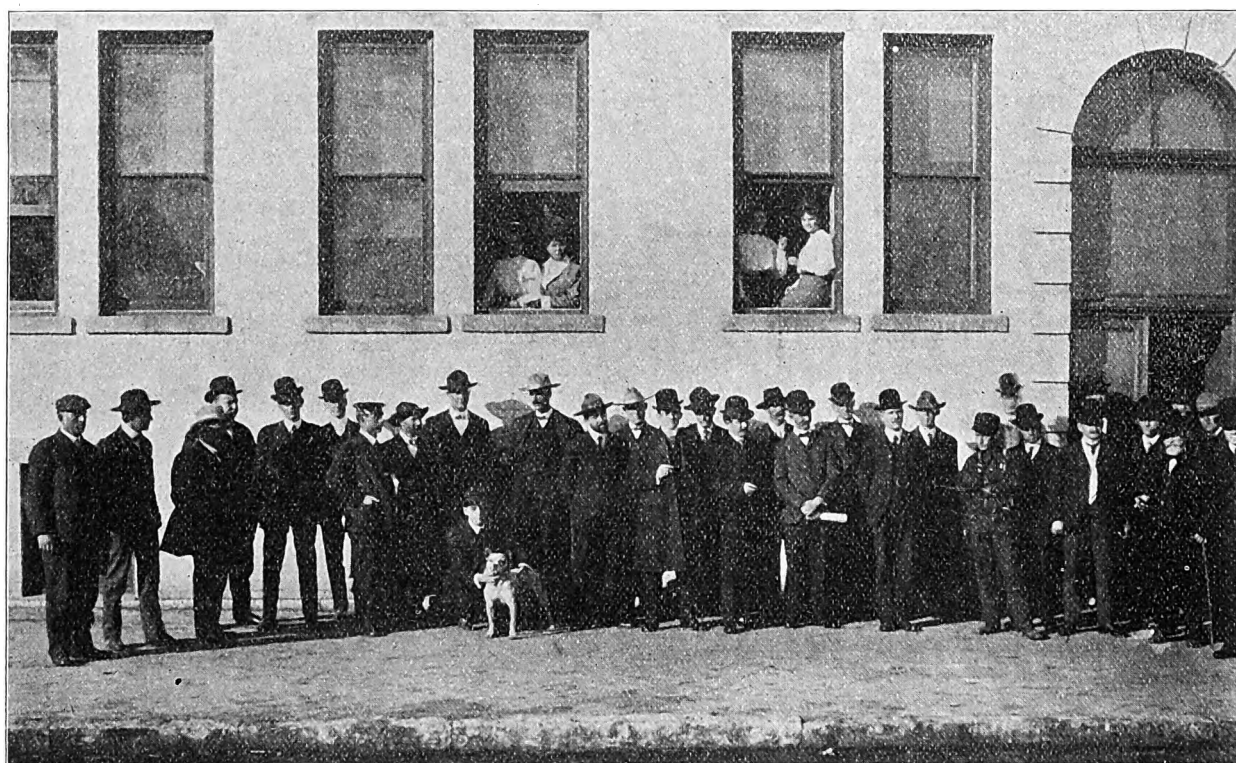
Mayor Miles, of Hastings, was introduced, and heartily welcomed the telephone men to the city. He likes the Independent telephone men because they are men who do things. They are men of enterprise and push, and

ing district associations, to report at the annual meeting in January. The following committee was afterward announced: W. J. Stadelman, F. E. Ebersole and R. E. Mattison.

The convention then adjourned until after supper.

On reconvening the subject of "Uniform Operating" was introduced for discussion, and remarks were made by several. It was the consensus of opinion that uniform rules should be adopted and given the operators on the exchanges and toll lines for the object of better local service and more rapid and satisfactory toll operating.

Mr. Mattison also introduced the subject of accounting in the toll business, and thought that the whole subject of rules for operation and accounting be handled together. It was moved and carried that it is the sense



are among the salt of the earth. He told them to take the city, but to return it as good as they found it. If perchance they got into trouble, to go to a telephone and if, happily they ever got central (the Bell), and then possibly got him, he would try to get them out.

Not all of the participants in the program being present, W. J. Stadelman, of Kearney, then read a paper on "District Meetings," which appears elsewhere in this issue.

Mr. E. R. Mattison, of Lincoln, then presented a paper on "The Traffic Association," which also appears elsewhere.

Mr. F. E. Ebersole, of Lincoln, spoke on "How to Check Bell Tie-Ups," which was ably presented and illustrated with maps and data.

Mr. Stadelman made a motion, which carried, for the chair to appoint a committee to devise a plan for perfect-

of the meeting that such uniformity is desirable and the matter be given into the hands of the traffic committee to formulate and publish full rules and forms for distribution.

Mr. Taylor then remarked upon the stringency and the length of the terms contained in the proposed operating contract. It was explained that a ten year contract was the very least length of term that it would be any use to draw. Investors want to know the value of the operating connections. In some other states forty-nine years is the term of the contract between operating companies. Mr. Pratt followed with remarks on the same line. It was moved and carried that a committee be appointed to draft a contract to be acted upon in January at the state meeting. Messrs. Ebersole, Pratt, Taylor, Garlow and Beaver were appointed.

Mr. Stadelman moved that the secretary correspond



with the secretary of the National association with a view to the State association joining same. Carried.

The larger part of the visitors remained in the city until the next day to look over the new plant and wait for Frank Woods, of Lincoln, who missed the train the day before. He assured those who were desirous that the Western Telephone Company should build to them that such were the plans of the company to be performed as soon as possible. The company has built a first-class No. 10 copper line from Lincoln to Grand Island, and one to Hastings this year, and it will be extended to Holdredge and Kearney as soon as the labor can be accomplished. Other lines have been determined upon, and in a few months the copper connections in Nebraska will be very extensive.

Everybody was much pleased with the new plant of the Hastings company. The building is a neat structure of gray pressed brick of one story and basement, containing rooms for general office, toll room, switch room, manager's office, private office, basement and lavatories. Six hundred switches are installed and thirty-three men are at work on the construction. They have up 122,000 feet of cable, of 275 to 25 pair capacity, and the capacity at the office now is 1,450 pair. Five hundred names are listed at present, and the solicitor is busy writing down the names of the new subscribers. They have in 100 farm 'phones and can reach 5,000 farmers by the companies in Adams, Clay, Webster, Hall and Buffalo counties. Their most important toll connections are with Holdredge, Kearney, Grand Island, Fremont, York, Lincoln, South Omaha, Beatrice, Kansas City and St. Joseph. Their officers are: J. W. Straight, manager; W. C. Ballinger, wire chief; W. P. Traver, superintendent; A. Korst, solicitor. F. E. Ebersole, of Lincoln, is a consulting engineer. They use the all-cable system exclusively, and a large portion of the work is underground in the business part of the city. They have about \$80,000 invested.

Wednesday morning the crowd was bunched before the exchange building and a picture taken.

Everybody left during Wednesday, feeling well repaid for the trip, and grateful to the Hastings people for their hospitality. A great deal was accomplished, and it is expected that full working agreements will be adopted in January, in place of the temporary ones now in force.

All the visitors were requested to register at the exchange, whereupon they were presented with a carnation, which was the badge of the delegates. Following is the roster:

A. J. Carter, with the Monarch, Sioux City; C. L. Fisher, Automatic Electric Company, Chicago; M. E. Shipley, Hooper Telephone Company, Hooper; C. Vail, Arlington Telephone Company, Arlington; F. W. Ashton, Grand Island Telephone Company, Grand Island; F. D. Roseborough, Western Electrical Company, Omaha; H. P. Blackledge, American Electric Company, Omaha; E. V. Revell, Hamilton County Telephone Company, Giltner; Geo. W. Brown, Chicago Telephone Supply Company, Elkhart; Wm. C. O'Connell, Western Electrical Company, Omaha; J. F. Munro, Nebraska Electric Company, Omaha; F. H. Wheeler, Oxford Home Telephone Company, Oxford; J. F. Kysela, National Telephone Company, Cleveland; D. C. Gould, Stromburg-Carlson Telephone Company, Omaha; O. E. Mickey, Osceola; E. F. McCord, Bladen; E. L. Larabee, Eureka Electric Company, Beatrice; F. M. Ferguson, Swedish-American Telephone Company, Chicago; C. MacIntyre, Illinois Electric Company, Chicago; Warren Pratt, Kearney Telephone Company, Kearney; W. J. Stadelman, Kearney

Telephone Company, Kearney; R. E. Mattison, Telephone Traffic Company, Lincoln; J. M. Harris, Western Telephone Company, Lincoln; E. C. Krewson, Elmcreek; W. D. Moore, Saline Telephone Company, Friend; S. G. Peticolas, Westinghouse Electric & Manufacturing Company, Omaha; A. M. Lathrick, Glenville; J. R. Shawcross, Glenville; G. W. Abbott, Inland; Geo. W. Kimball, Automatic Electric Company, Chicago; A. W. Nunemaker, Tobias; Sam Patterson, Arapahoe; Ezra E. Shultz, Kenesaw; Dr. Lyman, Hastings; M. W. Dimery, Crossing; Irving W. Pope, Omaha; J. T. Kelle, Harlan; Beaver Crossing; J. H. Ritchie, Beaver Crossing; Irving W. Pope, Omaha; J. T. Kelle, Harlan; H. Daubendick, DeWitt; E. H. Cox, Bladen; S. J. Rice, Harvard Telephone Company, Harvard; J. H. Yost, Harvard Telephone Company, Harvard; C. H. Beaver, York Telephone Company, York; A. G. Munro, Nebraska Electric Company, Omaha; W. E. Bell, Secretary York County Telephone Company, York; F. E. Ebersole, Lincoln Telephone Company, Lincoln; Frank Woods, Lincoln.

#### NOTES OF THE CONVENTION.

A Missouri Valley man is building a plant in Norfolk, having obtained the franchise granted two or three years ago to a local man, who has since died.

H. P. Blackledge represented the American Electric Telephone Company, going up to Kearney after the convention. He is arranging for a trip through the east with his wife.

J. W. Straight, manager of the Hastings Independent Telephone Company, exerted himself to entertain the visiting telephone men.

W. C. Ballinger, wire chief, is one of the original Independent telephone men of the country. He helped to install and was interested in the first Independent exchange erected in Ohio, using magneto transmitters. They afterward obtained electric telephones, being then threatened with infringing suits by the Bell. Nothing was done by them, however.

Mr. M. E. Shipley, of the Hoover Telephone Company, was present. He is a stockholder in the second Independent telephone company organized in the state.

A. J. Carter was seen wearing hot air protectors.

The general tone of the convention was one of the utmost harmony, but little variance of opinion as to ways and means being found, and none as to the objects to be sought. It is confidently felt that a complete organization of the Toll association will be completed in all points at the next meeting of the state association.

#### READERS, PLEASE NOTE.

All firms whose names appear in our advertising pages have been investigated so far as may be necessary, and we can assure our readers that they will make no mistake in patronizing any or all of them.

For reasons which must be quite apparent to any one on reflection, we must refrain from recommending one make of apparatus over another where so many different firms are represented in our advertising pages. It would be highly improper for us personally to recommend Jones & Co.'s telephones over Smith & Co.'s product when both are advertisers; nor would it be proper for us to say that the goods of an advertiser are better than those of a non-advertiser in this paper.

We wish to avoid making any comparisons except

what may follow in a wholly general and impersonal way from the technical contributions from time to time.

We make this statement for the benefit of those subscribers who have embarrassed us by requests to recommend some make of instruments for them to buy. Our invariable rule, as it needs must be, is to recommend the goods of our advertisers without partialty to any one of them. By so doing we avoid two dilemmas, viz.: The risk of arousing the resentment of our advertisers whose goods we did not recommend, and the risk of arousing the resentment of the subscriber, should we perchance recommend some line of goods more suited to different conditions than those under which he may be working.

Therefore, we beg our readers not to ask us to recommend goods. It would be embarrassing to comply and it is not pleasant for us to have to refuse. We do cheerfully recommend the goods of our advertisers, and this will have to be the invariable answer to all such requests.

### TEXAS INDEPENDENTS MEET

A called meeting of the Texas Independent Telephone Association was held at Dallas, Texas, on November 6, 7 and 8. President E. W. Dunaway presided. The meeting was held at the offices of the Consolidated Long Distance Telephone Company of Texas. The local office of the North Electric Company extended its hospitality to the delegates on Monday evening, when an informal, but delightful luncheon was served.

Tuesday morning the main work of the convention began. Cecil L. Simpson, of Dallas, discussed the "Texas Independent Clearing House Association." His presentation of the advantages of co-operation elicited the approval of all. He read the by-laws which had been drafted with relation to the clearing house and showed that the requirements conformed with the practice in Iowa, Ohio and other states.

Mr. J. B. Earle, of Waco, said that he did not believe the work of the Clearing House ought to be so expensive as the previous speaker thought it would be. He believed that the work could be handled for \$100 a month or less. He also objected to the article providing for an executive committee composed wholly of Dallas men.

Capt. A. J. Brown described the aims and purposes of the Texas Consolidated Long Distance Telephone Company, told of the obstacles it had met and overcome, and of its successful efforts to provide the state with a suitable Independent long distance service.

The afternoon session was principally devoted to a discussion of the clearing house question, the upshot of which was that a resolution endorsing the views of Mr. Simpson, heretofore stated, was defeated. On the defeat of the resolution, its principal opponent, Mr. Earle, accepted an offer to himself undertake the task of conducting the Clearing House for \$100 a month for the first year. On Messrs. Simpson and Brown agreeing that they would handle the business at Dallas for the same terms, Mr. Earle moved that the Clearing House be established at Dallas, which motion was adopted.

C. A. Shock, of Sherman, discussed the conditions in North Texas, where the Independent movement is in a flourishing condition.

Mr. Earle spoke on "How to Organize a Telephone Company on a Substantial Business Basis." He described watered stocks, declaring that all the money raised by the sale of stock should go into the business. The second important point is to interest home capital in the enter-

prise. Keep the stocks at home as much as possible. Let the local bankers and business men have a chance at it. In this way local interest and pride are kept up and the company will always remain Independent in fact, as well as in name.

Mr. J. A. Murray, of Fort Worth, advocated interchangeable coupon books. The matter was referred to the Clearing House and to the agreements among the several companies.

On Wednesday R. W. Bowden was elected a director of the Clearing House, vice J. B. Earle, resigned. The directors thereupon elected the following officers for the Clearing House: Cecil L. Simpson, president; G. R. Butler, vice president; E. W. Dunaway, secretary and auditor; Mr. Riddle, treasurer.

### VERMONT AND NEW HAMPSHIRE INDEPENDENTS MEET.

(From the St. Johnsbury Republican of Nov. 8.)

A convention of the Independent (non-Bell) telephone companies of Vermont and New Hampshire was held at Hotel Wentworth, Woodville, last Thursday. There was a large attendance present from all parts of both states.

The object of this convention was to form an Independent telephone association of all companies in Vermont and New Hampshire, the aim and purpose of the association being to cement together in a firmer union all Independent telephone interests in this section for the purpose of promoting uniformity of operation, maintenance and construction; to protect and defend all Independent telephone interests by moral efforts, co-operation and such other available means as may be deemed advisable; to prevent the enactment of hostile legislation and any and all other purposes that are deemed to the best interests of the association and of the Independent telephone movement and the people.

An organization was formed and the following officers elected: H. W. Buchanan, Barton Landing, president; C. D. Eastman, Woodsville, N. H., vice-president; G. W. Buzzell, St. Johnsbury, secretary and treasurer. There were twenty vice-presidents elected to serve as committees of arrangements. The association will be called the "Vermont and New Hampshire Independent Telephone Association."

The National Inter-State Independent Telephone Association emblem, adopted at the national convention held in Chicago last June, was adopted. These emblems are in the form of a shield seventeen and eighteen inches across; colors red, white and blue, and read "Independent, Local and Long Distance Telephone," and are to be placed at all Independent offices and toll stations. The Independent movement will have made a great advance when this emblem is displayed at every pay station in the country and the significance of it is understood by the telephone using people. Large lots of the signs will be ordered at once. Other meetings are arranged for the near future.

Charles F. Gronendyke, wire chief of the Union Electric Telephone & Telegraph Company, Davenport, Iowa, has resigned and accepted a similar position with the Canton Home Telephone Company, of Canton, Ill. Mr. Gronendyke was with the former company for three years, and on his departure was presented with a solid gold watch fob by the other employees of the company.

### HAVANA SUBWAY COMPANY.

After completing the conduit and cable contract with the Citizens' Telephone Company of Columbus, Ohio, contractor George M. Painter, of Chicago and New York, transferred his staff to Havana, Cuba, to take up subway work.

The Havana Subway Company are to have a complete electrical subway system to provide space for telephone and telegraph service, as well as individual underground electric light service and street railway distribution, if required.

Mr. Painter designed the equipment of the entire



INSPECTION BY AUTOMOBILE

plant, which embodies many novel plans for an effective flexible installation not usually met with in the subway equipment of the states.

His immediate staff comprises two engineers, Malcolm J. Beeton and Norman Malcolm, of Chicago, Illinois; two draughtsmen, César Rodriguez and A. B. Hill, of Havana; private secretary, H. P. Hughes, of Mexico City; H. G. Morse, of Chicago, and William Kennedy, of Havana, division foremen; ten cable splicers from the States, and three senior foremen.

Concrete construction will be used for the manholes, which are to be of special design to meet the requirements.

A large three story building, at number 6 San Ignacio street, has been secured for offices and storeroom facilities.

A force of 500 men will be used in order to finish the plant within the specified six months, for which period the contract was signed.

The cost of the present installation of subway equipment will be between eight hundred thousand and one million dollars.

This subway, if used by the various companies in Havana, will remove many bad conditions which now exist on account of the general use of overhead construction throughout the city.

The distribution for telephone and electric light wires will be so arranged that in the middle of each block a service manhole and ducts will furnish facilities along the face of each entire block for individual underground connections.

The electric light transformers will be located in special manholes at the street intersections.

City Engineer D. Lombillo Clark signed the permits for the first duct on October 26th. Work started on

Aguila street on the following day. Mr. Clark commented on the completeness of the plans presented by the engineer, Mr. Painter, who is serving also in the capacity of contractor for the Havana Subway Company. The concrete construction applied to new uses in these subway plans brought forth the hearty approval of Mr. Clark, who said he considered them up-to-date samples of subway engineering.

At present the Red Telefonica, Sociedad Anonima, which has the exclusive telephone concessions; the Havana Electric and Gas Company; the Havana Electric Company; the Compania de Electricidad de Cuba and the government telegraph are using overhead construction for their distribution.

### Subway Work Begins.

The work of building the subway of Havana has begun and more than a hundred men are now at work laying the pipes for the cables.

Aguila street is the scene of great activity, and the workmen who are engaged in laying the pipes are giving the people of Cuba an object lesson in construction work. Three blocks have already been laid with pipes, and the work is progressing at the rate of a block each day.

The Havana Gas & Electrical Company are showing their up-to-date methods by placing an electrical engineer at the disposal of their customers every day from 10 to 12 a. m., and from 2 to 4 p. m.

In their notice to the public, they said it was their business to sell current and that if they induced their prospective patrons to install apparatus through consultation with their engineer, free of charge, they would both be benefitted. Such a policy ought to bring them unusually good business.



EXCAVATING FOR SUBWAY

The new president, Edmund G. Vaughan, seems to be bringing out many good ideas.—Daily Telegraph, Havana, Cuba, November 11, 1905.

### Cubanettes.

#### PRESIDENT BLUNDELL MARRIED.

On Tuesday, November 14, 1905, Mrs. Maud Barratt was married to Mr. Alfred F. Blundell, the president of the Red Telefonica, Havana, Cuba. The ceremony was performed in Christ Church, East Orange, New Jersey, at 4 o'clock in the afternoon. Only the intimate friends of the couple were present.

They sailed for Havana on the 18th of November.

arriving there on the morning of the 22nd. Mr. Blundell has been in Cuba for six years and has many friends who welcomed the couple on their arrival in Havana.

He has a house at Calle 5 numero 23 Vedado, which was put in condition to receive the bride and groom on their arrival in Havana.

Edmund G. Vaughan, president of the Banco Nacional, of Havana, Cuba, has been elected president of the Havana Electric & Gas Company.

Capt. W. M. Talbott, formerly superintendent of the Red Telefonica, of Havana, has been elected vice president of the Havana Subway Company. He reports that the work is progressing in a satisfactory manner on the subway.

Norman Malcolm, formerly of the engineering department of the Chicago Telephone Company, is in Havana in connection with the new electrical subway system of the Havana Subway Company. He is one of the engineers on the staff of Geo. M. Painter, the contractor, of Chicago and New York, who is installing the system.

### SOME ILLINOIS JOTTINGS.

The Macon County Telephone Company, of Decatur, Illinois, of which C. S. Hankins is president and general manager, is in a very prosperous condition. The company has just put in a new International switchboard, 4,800 capacity, 1,275 drops installed. It has a full multiple central energy equipment, so wired as to connect with magneto exchanges and cut over at leisure. The Macon County Telephone Company has all the Independent 'phones in the county except about 600—in all 3,300 to 3,500 telephones. The Inter-State Telephone & Telegraph Company has two circuits, and all other toll lines radiating from Decatur as a center come from the Macon County Company. Macon county's telephone opportunities are not half developed. Toll line business has increased 150 per cent in four years and is still growing rapidly. The Macon county company has just opened a new office in the heart of the city of Decatur and is installing a new board. The new exchange will take care of toll messages and will have long distance booths. The new exchange is close to the business center of the town. Prospects for the future are deemed to be very bright owing to the development of the long distance toll lines by the United States Independent Telephone Company. Mr. Hankins and his associates have great faith in the United States company because of the men behind it. They believe that succeeding years will show the most active and permanent development which has ever come to the Independent field.

R. Armstrong, manager of the Christian County Telephone Company, Taylorsville, Illinois, states his company will install, about December 1, a Sterling central energy multiple board of 800 capacity. This company has 400 to 500 telephones, while the Bell has about 700. This means that there is a good chance for the Independent company. The Christian County company is a merger of nearly all the Independent companies in the county there being but two or three companies still out, and they are expected soon to join, either by merger or by contract. There are 3,000 'phones already in the merger, while the Bell has less than 1,000 in the entire county. The-Christian County company has good toll outlets, both by way of the Kinloch and of the Inter-State.

Your correspondent thoroughly enjoyed a recent visit

with F. W. Kelly, at Springfield, Illinois. Mr. Kelly is manager of the Springfield branch of the Inter-State company. While at Springfield the correspondent had the pleasure of meeting E. R. Conklin, president of the Inter-State, and F. Dagger, technical expert of the Canadian Telephone Commission. Mr. Dagger was here on a tour of investigation and was the guest of Mr. Conklin, by whom he was initiated into the workings of the Inter-State system. One of the pleasantest features of the correspondent's visit to the Inter-State at Springfield was his call on the chief operator, Miss Tottie Barnes, in the switchboard room, where he noted her perfect discipline of the operators and the ease and smoothness with which every detail of operating works in this large exchange. Miss Barnes has made such a striking success as a disciplinarian and chief operator that she will soon be sent out among all the exchanges of the Inter-State company, training the operators and bringing them up to the standard set by the Springfield exchange. Mr. Kelly said that in his opinion the future of Independent telephony is very bright. There are splendid opportunities for extension and development which will, no doubt, be so great as to tax the capacity of all the factories to keep up with the demands. This demand is for good apparatus, and will continue to be so, in order that the interconnection of the different companies shall not be interfered with by poor service on any line. The need for standard equipment is greater and greater, and cannot be supplied by any one company. The Inter-State company recently received a letter from a prominent Omaha packing concern requesting for its use telephone coupons to be made interchangeable among all the lines operating in the state.

### THE SPEAKING ARC.

At the recent meeting of the Western Society of Engineers held on November 10th, Prof. Freeman, of the Armour Institute, gave a talk on the speaking arc. In order to illustrate his remarks an arc light was mounted on a stand in front of the audience, the supply of current being taken from the regular city 110 volt mains. Connected in the circuit of this arc were placed coils of wire wound around iron cores, forming considerable induction. A telephone circuit was shunted off from the coils and lead to a room some distance away where an Adams-Randall transmitter was mounted. A speaker at the transmitter read, sung and played a flute, all of which was well reproduced at the arc much to the astonishment of the audience. While the articulation was not all that could be desired the intensity was great enough to fill the entire hall, something which we believe has rarely been accomplished. Ordinary transmitters can be used in the production of the speaking arc, although in such cases the transmission is very feeble. An instrument of the Adams-Randall type, which will carry a large current, is found to produce very excellent results.

In discussing the phenomenon Dr. Wilder, of the institute, says that he sees no reason why this experiment cannot be improved to such an extent that an arc will reproduce all of the tones spoken into it with the clearness of the ordinary telephone apparatus. While such experiments are merely novel features, it is hoped that improvements will lead to such perfection that a speaker in a very large hall may talk into a transmitter and have his words reproduced by every arc light distributed throughout the hall. In this way a speaker might be easily heard in all parts of a mammoth convention hall.

# Telephone Stock Should Pay Dividends

J. H. M'CLURKIN

For the purposes of this article Independent telephone plants may be divided into two classes, those of the larger cities, where a financial policy was definitely outlined and strictly adhered to in the formation and management of the company, and those which were organized in the smaller cities and towns, by a number of patriotic and energetic citizens, with the sole object of supplying Independent telephone service to their friends and neighbors.

The organizers of those companies included in the first class practically financed their project before undertaking the work of construction. For instance, the promoters of an Independent telephone plant in a large Indiana city determined the amount required to construct the plant, and at the same time provided for a bond issue to be offered through their allied bankers and brokers, with the understanding that a stock bonus would be given as an additional inducement to the purchasers of the company's bonds. Provision was also made for the growth and extension of the system, by providing for additional money, from time to time, through the sale of the treasury bonds. The inducements appeared so attractive that the public took the bonds, thus providing sufficient money to carry out the undertaking; hence, the only problem confronting them was that of making good their promises. In one or two instances the promises of the promoters as to the future profitability of the investment have not been satisfactorily demonstrated. However, that is a matter which only the future can determine, and we will now direct ourselves to a careful analysis of the conditions of those plants included in the second class.

The experience of the writer justifies the statement that very few of the organizers of the smaller plants undertook the work with any idea of making money. The business men of the small city found themselves either without a telephone system, or the field was covered by a company rendering wholly inadequate service at high rates. A few of the prominent and progressive business men, after corresponding with the manufacturers of telephone apparatus, concluded that it would be advantageous to themselves and their neighbors to undertake to supply the town with local service. Consequently, after more or less discussion, a few of the more venturesome formed a mutual organization, each putting up a limited amount of money, and thus a new Independent telephone company was born. In many instances the birth of the new born child was heralded with loud acclaim and the organizers soon found themselves flooded with applications for service.

The experiment, undertaken only after much hesitation, soon proved far more successful and profitable than the most sanguine promoters of the affairs had dared anticipate. There are many reasons why the success was phenomenal. The officers and directors, as a rule, contributed a great deal of their time and attention free of charge; each stockholder became a

solicitor, and recommended the service to his friends and neighbors, or placed its stock among the tradesmen, thus uniting the varied industries and securing the hearty support of the entire community, which is so necessary for the success of a public undertaking. As a result of the devoted and courageous zeal and energy of the organizers of these companies, the service was rapidly extended, until the Independent telephone system has demonstrated its right to be considered a factor in the business world.

But what about the stockholder who backed the enterprise with his hard cash? Very few of the companies, at the inception of the business, gave the matter of the payment of dividends much if any thought. Now, after several years of continued growth and development, the stockholder finds that his original investment of \$1,000 is now represented by possibly \$2,500 worth of property. The great concern of the directors has usually been the furnishing of service to the many applicants. As fast as the revenues were received from the rental of telephones, they were immediately paid out for new equipment, or for the improvement of existing construction. In fact, that board of directors has been unusually fortunate that was able to supply the new service from the earnings of the company. As a rule it has been found necessary to secure additional funds from sources other than by the sale of stock.

It is a well known fact that in many instances, where no provision was made for the regular payment of a small cash dividend that the original stockholders soon lost a great deal of their zeal and enthusiasm, and declined to furnish additional capital, which not only greatly hampered the extension of the service, but temporarily retarded the advancement of the Independent telephone movement in general.

It may be well, at this point, to illustrate the importance of a company so arranging its finances that its stock will have a well established and marketable value. The market value of a stock is largely determined by its earnings. The fact that a stock is paying regular dividends (though it may contain a great deal of "water") gives it a market value. In other words, though the value of the property represented by the stock may be worth far more than its par value, yet it is very hard to find a purchaser for the stock unless it is paying the owner a regular dividend.

The fact that a stockholder receives a statement from the board of directors showing the amount of business transacted, the amount of earnings, and the growth of the company, but is advised that all the profits have been expended in new construction, while it is a pleasing report, yet it does not enable him to add to his savings account, nor does it encourage him to increase his investment in the telephone stock. Consequently calls for new capital do not meet with a ready response.

Take for instance the stock of the Wabash railroad. Every one knows that the Wabash is a fine railroad. It is equally well known that it is making a great deal of money, and is in a position to largely increase its earnings in the coming years, yet its common stock

sells for about 21. What is the reason? Is it due to the fact that the public does not place sufficient faith in the ability of its management? Or is it due to the fact that purchasers of railroad stocks are fearful of some disastrous results, by reason of the fierce competition among the railways in the Central states? Or do the company's books show that the property behind the stock is not good? Is it not because the holder of Wabash common stock does not receive a check, at stated periods during the year, for dividends? The earnings for many years have been diverted to improvements and extensions.

On the other hand, let us take a look at the common stock of the Simmons Hardware Co., which claims to have the largest general hardware business in the world. The selling price of the common stock is now in the neighborhood of 123. The common stock of the company has paid regular cash dividends for many years, notwithstanding the fact that the management has been very aggressive, and has constantly extended the business, until now a customer can be found in almost every town and hamlet in the United States. New money has been secured, from time to time, as the demands of an increasing trade required it, through the sale of bonds. But do you suppose the owners of the common stock would think so well of it, or that it would find a ready purchaser, if the holders were to be told by the directors that until further notice, all the earnings would be utilized in the erection of commodious warehouses in various trade-centers throughout the United States, and in the employment of additional salesmen? They would have the satisfaction of knowing that the security back of the stock would be more and more valuable, year by year, but there would be a steady and rapid decline in the market price of the stock. It would be but a short time until the holder of a block of the stock would find himself in a position where a sale would be necessary to protect other interests. His banker would not care for it, as he could not derive an ordinary rate of interest on the investment; neither would a financier be willing to take it as collateral on loan, as he could have no assurance of disposing of it at a satisfactory price in case the loan was not repaid.

We need not dwell further on this subject, as it should be readily apparent to even the most casual observer that purchasers of stock are seeking investments which promise a reasonable return in cash on their capital. Many holders of telephone stock are beginning to realize that some tangible return is due them. They are now supplying satisfactory telephone service at reasonable rates to many of their fellow-citizens who do not risk any capital in the enterprise. Should they not have some material compensation for embarking in the business when in an experimental stage?

On the other hand, they are confronted with a statement from the manager that he always has a number of applications awaiting service, and that the field has not yet been covered and that more money is absolutely necessary to keep pace with the growing demand for the company's service. An Independent telephone company, to maintain its prestige, must supply every applicant who is able to pay for the service. It is said that the president of one of the largest Bell companies in the South has stated that it is his ambition to have

a telephone in the house of every man in his territory who is earning a dollar per day or more.

Every Independent telephone company should certainly strive to cover its territory to such an extent that practically every business house and home is supplied with service. This will necessitate, in many instances, considerable expenditure of money. It will be necessary to construct new pole leads to string additional aerial cables, to purchase new switch boards and new instruments; underground conduits will be absolutely necessary. All this extension of the system costs money. How is it possible to keep pace with, yea, even keep in advance of the present demand for service and, at the same time, pay regular dividends to the stockholders? Would it not be very desirable to pay regular dividends and provide for new business through the sale, from time to time, of low interest bearing bonds?

### ANSWERS BY THE READERS

Editor SOUND WAVES:—I have the following answer to the query of A. L. R. regarding a howler:

Your need is not clearly enough stated. If it is merely an interrupter that you want, a buzzer is the best and cheapest instrument you can use. If you need a higher frequency of pulsation than the buzzer is capable of giving, the Wehnelt interrupter will answer the purpose nicely, and is inexpensive.

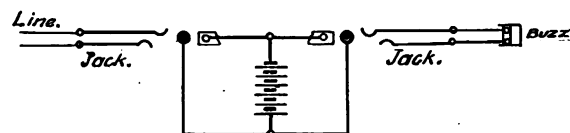


FIG. 1.

Your article reads as though you had another piece of apparatus that needed to be actuated by an interrupted current. My experience has been that a common buzzer connected in series with a closed circuit cell and bridged across the short circuited line, will hang up the receiver.

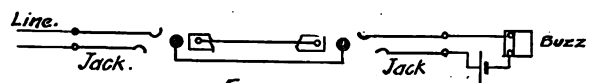


FIG. 2.

If you wish to have the interrupter mounted as your article suggests, there are two ways of doing it. You can connect the buzzer to the two springs of a jack, and use cords carrying the battery as in figure 1. In this case the resistance of the buzzer should approximately equal the resistance of the line, for the best results. A more preferable way, however, is to connect the battery and buzzer in series with each other and then to the springs of a jack, and then use a "dead" pair of cords as in figure 2. The advantages of this method are that the resistance

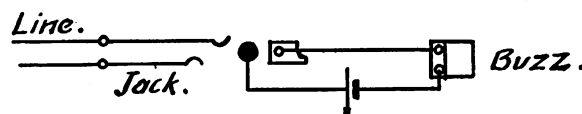


FIG. 3.

of the buzzer may be anything, and the buzzer being in series with the short circuit, stops as soon as the short is removed, giving a signal that the line is clear. A mod-



ification of the second method may be, to have the buzzer and the battery connected to a single cord, which is used for this purpose exclusively, Fig. 3. B. L. Z.

(We would suggest that the circuit shown in figure 1, is not operative because the buzzer circuit will not create any noise on the line for the battery will short circuit any such effect away. A retardation coil should be placed in the battery circuit between one end of the battery and one of the strands of the cord. In figure 2 better results on lines of all kinds of resistance may be obtained, by placing an induction coil in the cord circuit. The buzzer circuit will then be local. The lines are not necessarily short circuited when the receiver is left off the hook, but there may be several hundred ohms in circuit.—Ed.)

We have another method suggested for the lighting of the telephone booth, suggested by F. B. L.:

To arrange for the lighting of the booth, take a woven or corrugated door mat and fasten a soft rubber button on each corner so that the mat is elevated from the floor about half an inch. Next, place a German silver button in the middle of the floor of the booth, and then place the mat over the button so that when the user of the telephone is in the proper position for talking he will have to stand upon the mat. The lamp circuit should then be wired to the mat, and the button under it, and the circuit will be closed by the pressure of the telephone user.

The same gentleman suggests the following as a solution to the problem given by L. B. K.:

"If L. B. K. wishes to add a 40 ohm annunciator drop to a switchboard of the polarized ringer type, I would suggest that he fasten a small brass brad or screw so that each time the clapper vibrates it will strike against the brad. This brad is connected to one or two cells of dry battery. The other side of the battery runs to the 40 ohm drop, and from there connection is made to the frame of the ringer movement. Each vibration of the clapper causes the brad to be struck and the circuit is closed through the drop. The bell should be adjusted so that the clapper cannot quite touch the brad when standing still. Several bells may be connected up in this manner, using the same battery."

Editor SOUND WAVES:—In reply to the queries of A. L. R. regarding a howler circuit, I will give to your readers the circuit that I employed on one of my boards. It is very simple and of no cost to speak of, if the battery is already installed. Secure a common electric door bell, take off the gong and cut off the arm close to the vibrator, here we have the interrupter. Place this in series with an open spring jack and batteries and you have the cheapest howler made that will work under all conditions.

R, A. D.

### THOSE QUESTIONS.

There has been an interesting assortment of answers to the questions asked by A. B. C. and L. B. K. To the former there have been more answers, probably because it was easier. We are giving some of these answers, as follows:

To SOUND WAVES:—In regard to the first problem on page 393, of the October number, I suggest that L. B. K. connect the two coils of his 2500 ohm ringer in parallel instead of series, as at present, taking care to connect the coils in the proper direction, thereby reducing the resistance to roughly 600 ohms. Then connect the 40 ohm drop in series with the ringer. A properly adjusted 40 ohm drop ought to fall through six hundred ohms, and the

modified ringer will not be too low in resistance to bridge across the line.

In regard to the second problem, let A. B. C. arrange a false floor in the booth, hinged on one side and fixed to drop a half inch or so against a stop by the weight of a person entering the booth. A set of contacts would close the lamp circuit when the floor was down. A suitable spring would open the circuit by raising the floor when the patron vacated the booth. I believe this fulfills all conditions of the problem. W. D. H.

A. B. C., care SOUND WAVES:—In reply to your request in above named paper of October, 1905, relative to device to light booth lamp only when party is inside and to be extinguished when talk is finished, I beg permission to submit a scheme I used when employed by an Iowa company.

As I presume that you do not need to use any switchboard drop on the booth line, I assume that you can easily cut drop off line. Solder two wires on the two terminals from jack, and then to these attach a battery and a small pony relay. Now if the plan of board is one that the inserting of the plug in the jack opens the circuit to the drop, then you will have to reverse the contact points on the relay and use a closed circuit battery on the relay so that whenever the plug is inserted in the jack the line circuit of local relay is opened, then the secondary side of the relay will close circuit to lamp.

If the type of board is one that closes the two jack springs, thereby short circuiting the drop when plug is inserted in the jack then you need to use only open circuit battery and allow relay points to remain, so that upon closing of battery on the terminals at jack the battery will cause relay to close lamp circuit.

After using the above scheme for some time I found it very satisfactory. Trusting that the above will be of help to you, I remain,

C. S. S.

Editor SOUND WAVES:—A. B. C. wants to know how to light his telephone booth in such a way that it will only be lit when it is being used, and I will tell how I did it.

I have two miniature, three candle power lamps, with current from dry cells (though storage battery would be better). In the circuit is a spring contact placed on the door jamb in such a way that the closing of the door will close the contact and light the lamps. I found that invariably the party, when coming from the booth would close the door and so light the lamps again, and if it was not noticed would waste the battery. So I took the little beveled spring catch and built it out square by soldering on a piece of brass, so that it would strike the catch plate and not be pushed back into the lock.

Then I took the knob off the outside of the door and it was impossible to latch the door from the outside, and as the door had to be latched to light the lamps the thing was accomplished.

Of course the knob on the inside had to be turned in order to latch the door, and to make that easy I filed the catch with a bevel on both sides, but only near the point or end, in such way that the slightest turn of the knob drew the catch back till the beveled part came on the catch plate, when the door could be pulled to as ordinary. It absolutely requires a slight turn of the knob before the door can be latched, and as there is no knob on the outside it is impossible to light the lamps except when within the booth.

W. H. R.

Editor SOUND WAVES:—In regard to the problem submitted by A. B. C., I have the following to submit:

A lever is provided, upon which the party using the telephone places his elbow. The pressure of the elbow lowers the lever, which movement releases a switch which is in the lamp circuit. The switch is then closed by the party and the lamp is lit. When through talking the party hangs up the receiver, releases the lever, which is restored to the normal position by means of a spring.

Restoring the lever permits the switch to snap open.

L. B. K.:—I herewith enclose the following: The circuit consisted of the drop bridged across the line, with the bell also bridged across the line in series with a condenser. It is obvious that the drop would interfere with the action of the bells on the line as per the conditions of the problem.

C. C. S.

## Talks and Queries

### Swinging Ground.

Editor, SOUND WAVES:—We have a line about fifteen miles long with eighteen 'phones on it. Several times this summer our bells quit ringing without any apparent cause, and then commenced ringing again. I would like to know where to look for this trouble. It is a grounded line and has been in use about two years.—G. M.

Look for a swinging ground on the line. This is a difficult case to handle. The trouble is probably in the arrestors on the telephones or on the line. Go over all the telephones and see if the arrestors are perfectly clean. Thunder storms are apt to cause this trouble and consequently all arrestors should be carefully inspected after each storm.

Some people are in the habit of putting things on the top of the 'phone, and if metallic such things are apt to cause the trouble. This is a favorite place for grandma's spectacles.

Examine all the inside wiring and see if, by any chance, there could be a cross between the line and ground wire. See that one staple does not hold two wires.

Go over all the line and examine for a cross which would place it in direct connection with the ground. Sometimes there is a guy wire that comes into contact with the line and this will ground the wire dead. Look carefully and see if the wire comes into contact with any eaves, troughs or water spouts on any of the houses where it is connected. The only way that you can run the trouble down is to go after it and keep at it till you find it. It will take patience and perseverance, but you will get it in the end. The chances are that the trouble is not in the telephone circuits themselves.

### Cross Talk in an Exchange.

Editor SOUND WAVES:—I would like to have you tell me some of the ways that you have heard for eliminating cross talk. In our exchange we have about 150 subscribers, about half of these are on full metallic circuits and the remainder are on common return split into three different and distinct leads.

We have one of the latest styles of switchboards with all the latest improvements. We have only six out of town circuits that are grounded. There are two or three places that I could look for this trouble, but there is a lot of expense connected with the cutting over and changing the distributing racks and cables. If you will kindly give me all the information that you can gather on this subject, you will greatly oblige.—R. A. D.

It would be a long story to give you full information for there would not be room in this edition. We think that we can give you a few hints that may help you.

In the first place, it is presumed you have good cables. Insulation leakage is cross talk by conduction and can be cured by taking the proper precautions for making the

insulation good. The conductors should be twisted in pairs in all cases and each circuit should take one full pair. It will not do to have one side of a circuit on one side of each of two pairs. Everything, including the common return and grounded lines, should run through the cable complete metallic circuit, or there will be all kinds of cross talk. You can get the ground at the cable pole if you wish, or run the common return into the office outside of the cable and make your ground there.

Be sure and have all the joints in the common return well made so there can be no appreciable resistance at such points. If the leads are long you should have the return wires of copper. Iron wire has a great deal more resistance than copper and will be more apt to cause cross talk. If iron wire is used for the return solder all the joints. At the cable pole one side of each pair of cable connecting with the common return lines should be soldered to the common return, and the other side should be soldered to the line wire.

To ascertain whether the cross talk is in the office, disconnect one of the lines that shows the trouble and listen on it at the cable terminal. If you still hear the cross talk you will know that it is out side, but if there is nothing heard, you may know that the trouble was inside. If inside, test and see if you do not have some drops that are grounded on the metal frame of the switchboard. Sometimes there is a great deal of trouble right in the cross connecting board, caused by improperly connecting. If paste or acid has been used in soldering, there is almost sure to be cross talk. Nothing but resin should be used as a soldering flux.

If your metallic lines show cross talk outside look to your insulation, except on long lines, where they should be properly transposed. Long grounded lines on the same lead of poles, will show cross talk in spite of anything that you can do.

Don't be afraid of a little expense to make good service.

Charlie Zahm, of Los Angeles, Cal., was in Chicago recently on business. Mr. Zahm will engineer the construction of the Portland, Ore., exchange.

The Home Telephone Company, Decatur, Ill., is installing an International board of the lamp signal, generator call, magneto multiple style. This board is of their special type, easily convertible to full metallic central energy without alteration in the original installation with but minor exceptions.

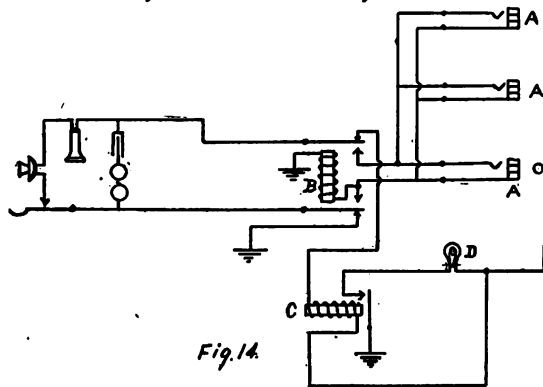
Sound Waves only 50 cents a Year.



# Principles of Central Energy Systems

W. A. TAYLOR, M. E.

The circuits illustrated in figures 12 and 13, as was mentioned, are those in use by the Bell companies. While this system is very good, there are others in use by the Independent companies that are in every way as good and in some respects better. One of the main necessities in the construction of central energy exchanges is to provide more rapid service and also to provide service to more lines. The largest practicable magneto boards will not provide service for more than 6,000 lines, without making the work of the operators very laborious. The larger the board, the farther the operator must reach in order to connect with the farthest multiple jacks. It is evident that if the jacks can be made smaller, more of them may be placed in the same space. The multiple jacks have as many as five springs in magneto switch-boards, but in central energy boards they have been made with but two springs. Magneto multiple jacks are usually spaced one-half inch apart, both horizontally and vertically. Central energy boards have been made having the multiple jacks spaced but three-tenths of an inch apart. With the same reach to the farthest jack 19,000 lines may be accommodated. On the smaller boards it does not make much difference if the jacks are spaced farther apart. The operator can easily reach all lines anyhow.



The cord and plug of the boards having the larger number of jacks must be made very carefully for they must be small. A plug that is but three-tenths of an inch in diameter must be weak unless made of the best material and by the best of workmen. A two-conductor cord is, of course, used on boards that have jacks with but two springs.

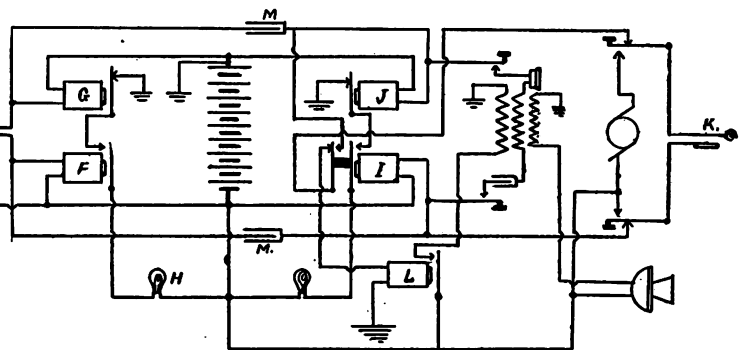
## PRINCIPLES OF CENTRAL SYSTEMS.

Figure 14 shows the line circuit of a central energy system devised for large switch boards, and figure 15 shows the cord circuit.

In figure 14 A, A, A, represents the multiple jacks which, as is seen, have but two points of contact. C is the cut off relay, which, when operated, will cut the lamp relay C from the circuit and thus extinguish the line lamp D. It will be seen that the jacks are disconnected from the line entirely, at the contacts of the relay B, and that they are connected with the line only when the relay is operated. The act of lifting the receiver from the hook

of the telephone permits the current from the battery to traverse the relay C, contacts of the relay B, and the line.

This current causes the relay C to operate which lights the lamp D. The lighting of this lamp attracts the operator and she inserts the plug E into the jack corresponding to the lamp. When this is done, current passes from the battery, passes through the supervisory relay F (Fig. 15), sleeve strand of the cord, sleeve of plug E, relay B, and from there back to the battery again. Both relays F and B are then made to act. The contacts of relay B are changed so that the line relay C is disconnected and the jacks connected to the line. As soon as the jacks are connected to the line the relay G is actuated so that as long as the subscriber has his receiver removed from the switchhook the armature of this relay will be drawn up. Observe, therefore, that both of the supervisory relays F and G are actuated while the subscriber is using the telephone; also that the relay F is operated as soon as the plug is inserted and remains pulled up till the plug is withdrawn. The contact of F is closed as long as the plug is in the jack. The contact of G is closed as long as the receiver is on the hook, but open when the receiver is removed. When both of the contacts are closed the lamp H is lighted. When the contact of relay G is open the lamp is extinguished. This is equivalent to saying that when the subscriber takes his receiver from the hook the lamp is extinguished, but when he hangs it up the



lamp lights. The operator knows exactly the condition of the connection. When the plug is disconnected, the contact of relay G is closed; but as the contact of relay F opens the lamp H does not light. The two sides of the cord circuit are nearly the same. There are two relays on the other side, but one of the relays, I, has double contacts. One of these contacts performs the same functions as the contact of relay F, but the other contact serves the purpose of keeping the tip strand of the cord disconnected from relay J. This is done to afford an efficient busy test. Before the operator makes a connection she touches the tip of the plug K to the sleeve of the jack. If a click is heard in her receiver she will know that the line is busy, but if there is no sound heard, she will know that the line is clear. As soon as the plug is inserted the contact in the tip strand is closed and remains so during the time that conversation is in progress. If the line is busy when the operator tests, the current from the talking circuit of the busy line will enter the tip of the plug and pass through the contact of relay I, through the relay L and back to the

battery. The armature of the test relay is instantly pulled up and this closes the circuit through the third winding of the operator's induction coil. She thus receives the test sound in her receiver. The test relay is common to all the cord circuits of the operator's position. This relay is wound to a very high resistance so that there may be no disturbance to the supervisory relays of the cord connected to the busy line, and also to prevent an unpleasant sound in the subscriber's ear. The four relays of the cord circuit act as impedance coils as shown in figure 4 (September Sound Waves). The condensers M M, are also used to permit transmission of the voice from one cord to the other.

When a switchboard is made with the two spring jacks there must be relays added in order to do what the jack ordinarily does. Of course this adds considerable apparatus to the board, but this is a necessary evil in order to be able to handle the work properly, and to reduce the complication in the switchboard cabinet. The relays may be placed at any convenient place outside of the switchboard and thus relieve the crowding of the parts in the cabinet. The weight of the multiple cables in a large switchboard is something tremendous, and therefore any saving in the size of the cables will relieve the board of great weight and also cheapen the cost of the manufacture of the board. In boards of equal size the one having four point jacks will require nearly twice the weight of multiple cable as the board having the two point jacks.

The weight of these cables becomes so great in the larger boards as to present great difficulty in getting at the strips of jacks. A special form of lifting jack is generally provided to raise the cables so that inspection and repairs to the spring jacks may be made.

The power plant in the central energy exchange is a very important part and it must be so designed that at no time shall the charging current for the storage batteries fail. If this plant is not arranged so that charging cur-

rent shall be available at all times, there may be a time when the batteries will run down and then the whole exchange will be out of service. It is the usual practice to have a double power plant throughout so that no matter what may occur, there will be a charging current available. There are several ways of providing against a breakdown. In most of the larger cities there are two outside sources of power. One may be an alternating current and the other direct. In such case there will be an alternating current motor arranged to drive a direct current dynamo of the proper voltage to charge the battery. The direct current would be used to drive a motor generator, which would reduce the voltage sufficiently for the battery charging.

The usual practice is to provide a gasoline or gas engine which will drive the charging dynamo. The other supply is taken from the city mains. This arrangement gives the exchange a supply of energy which is absolutely independent of any outside power station.

So far the central energy systems have been confined almost entirely to the larger towns, for the expense of small exchanges is most too great to make it worth while to spend the money upon it as long as the rates are so low. It is getting to that point when it looks as though competition will drive many of the small plants to central energy even though the dividends are sacrificed. Probably the next few years will see many exchanges of from two hundred to four hundred subscribers changed from magneto to central energy.

Some inventions in charging machines have recently been made which will cheapen the cost of the power plant and at the same time make it more reliable in the hands of unskilled help. As the power plant is the part which makes the small exchange so expensive, a cheaper arrangement will, no doubt, tend to increase the sale of the central energy switchboards.

[THE END.]

## Testing Methods of Telephony--II.

P. KERR HIGGINS, A. M. I. E. E.

In a previous article we considered some simple methods of testing, including those with the voltmeter. In order to make possible more accurate results, we are compelled to use more sensitive and delicate apparatus, hence the galvanometer, the Wheatstone bridge, shunt, standard resistance and capacity, and the necessary switches for changing the conditions, the introduction of battery, etc.

### GALVANOMETERS.

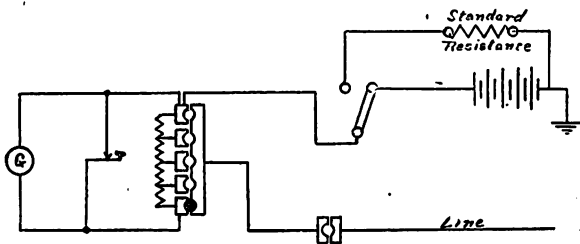
A galvanometer is an instrument for measuring electric currents. The principle of the galvanometer is the action of a magnetic needle suspended in or between a coil or coils of wire. If a current is now sent through such a coil the needle will respond and be deflected, such deflection being proportional to the current flowing. The galvanometer is, as has been said, an indicator of the presence of a current and used in conjunction with a Wheatstone bridge can be used for measuring resistances. The galvanometer tells not only the presence of a current, but its direction. In order to be serviceable it must be sensitive. In order to facilitate quick readings it is nec-

essary that the instrument be properly calibrated, and this is done by comparison with a known standard. In order that the galvanometer may be as sensitive as possible the needle should be as light and small as practical, so as to insure an easy movement; the earth's magnetism has an effect on such a needle and tends to slow up its movements, hence it should be protected by means of another magnet or be placed in a close magnetic field. The most modern and efficient form of galvanometer is some form of the mirror type. The first of this class was probably the Thompson type which, in later years, has been superseded by the D'Arsonval dead beat type. Such delicate apparatus is only necessary in very fine testing. Therefore, before considering these, we will examine some of the simpler forms.

Probably the simplest form of galvanometer is that of the magnetic needle itself, properly suspended. If now a wire in which a current is flowing is held parallel with this magnetic needle the needle will be deflected and tend to set itself at right angles to the wire. Now this needle may be furnished with a pointer and so arranged as to

pass over a scale, divided off into degrees; now it is apparent that the movement of such a needle under influence can be measured. In order to increase this effect make up a small bobbin and on it wind some wire, leaving a space inside the spool for the location of and free movement of the magnet, the pointer extending beyond the spool so as to move over the scale freely. By such an arrangement the effect of the current is very much multiplied.

Such a galvanometer will fill all the requirements of ordinary testing and may be made up in neat form and enclosed in a glass cover with suitable terminals for connecting the outside terminals to the galvanometer coil. The readings on such an instrument will be proportional to the resistance in circuit. Ohmic resistance, as is generally known, is directly proportional to the length of



SKELETON OF TEST—DEFLECTION METHOD.

the circuit; and inversely proportional to the area or cross-section of the conductor, and varies with the temperature and material used for the conductor. The unit of resistance is the Ohm, so named after the discoverer of the law now known as Ohm's law. In galvanometer work the galvanometer constant is necessary in making insulation tests, that is, tests of lines or apparatus having high resistance. This constant is the deflection which would be obtained if the galvanometer were connected up in series with one megohm (one million ohms) and the testing battery.

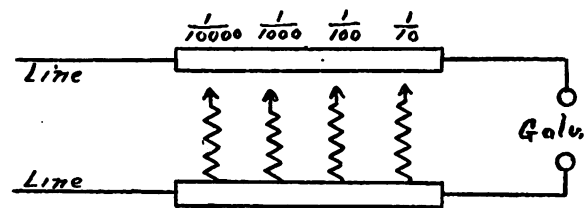
In resistance testing two kinds of resistance are known, (1) conductivity resistance, (2) insulation resistance. In the former other special apparatus is necessary such as the Wheatstone bridge, etc. In the latter the galvanometer is the prime factor as it is a question of deflection and is known as the deflection method. A similar test can be made by means of the voltmeter method, but on account of its lack of sensitiveness there is a limit to its reliability. In such a test the voltmeter is connected in series with the battery and the high resistance to be tested and the reading then obtained is compared with a known resistance, or it may be done with and without the high resistance in circuit, in which case the insulation resistance is equal to the resistance of the voltmeter

multiplied by  $\left\{ \frac{\text{voltage with resistance cut out}}{\text{voltage with resistance cut in}} \right\}$  the answer being in ohms. In testing with the galvanometer method the arrangement is somewhat similar, but allows of greater accuracy and a larger range of measurement. The deflection on the galvanometer is that caused by the current in passing through the high resistance; if the high insulation is connected up in series it may, however, be necessary to measure a line on which the other or distant end is open, in which case one pole of the battery is connected to ground. This deflection is inversely proportional to the resistance and is divided by the galvanometer constant already referred to, the result being in megohms.

To obtain the constant the same conditions are set up using a standard resistance in place of the unknown resistance, say 100,000 ohms (one-tenth megohm); in such a case the deflection would have to be multiplied by ten to get the constant in megohms. This constant will remain and can be used for several tests unless the conditions are changed. Great care must be exercised not to allow too much current to flow through the galvanometer and so if a large battery is necessary, and it usually is in such tests, then a shunt should be provided to reduce the current flowing through the galvanometer. Such a shunt is usually made up in a box having fixed shunts of one-tenth, one-hundredth, one-thousandth and one-hundred-thousandth, and the use of such a shunt performs the function of reducing the current one-tenth, or more, according to the shunt used, and such a shunt must be made suitable to the galvanometer it is to be used with and generally form a part of the testing equipment. If such a shunt be found necessary then the deflection must be multiplied by the value of the shunt used, to obtain the true deflection of the constant or of the test. As a precaution against damage to the galvanometer (due to a short or a ground) it is well to have the one-tenth megohm resistance box connected up in series with the galvanometer, and if a good readable reading is not then obtainable, the resistance can easily be plugged up. In such a case it will be necessary to subtract the standard resistance used from the result.

#### FAULTS IN TELEPHONE WORK.

The faults generally noticed in telephone work are (1) shorts, (2) opens, (3) crosses, (4) grounds. When a line has a very low resistance to ground, indicating a leak or break, the line is referred to as being "dead grounded;" when the same conditions exist with a high resistance, it is known as slightly grounded; if extremely high and showing only a slight deflection, improving during the day time, it is then known as poor insulation, or a leak, due to broken insulators, or limbs of trees or kite strings, etc., which when wet or moist permit leakage to

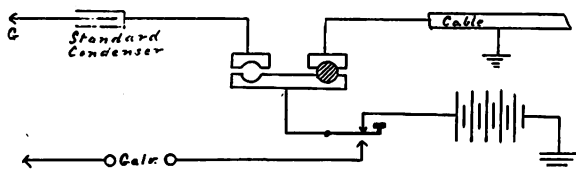


USE OF SHUNT.

take place between the conductor and the foreign body to ground.

A complete break may be either grounded or open. A short circuit cuts off the communication and shows an abnormally low resistance between the two sides of the circuit. A cross is generally known by the overhearing of conversations (or cross-talk) on other wires, and which on being tested shows the trouble to be either leakage between them or an actual cross, according to the resistance between the sides of the circuits in trouble. The most difficult trouble to locate is what is known as intermittent or swinging trouble, either an open, a cross or a ground. To make accurate tests of any character we need, in addition to the galvanometer, a Wheatstone bridge. Such an instrument consists of three arms, one the rheostat, with a range of say from 1 to 11,100 ohms,

and two other arms, called ratio arms, having, say, resistances of 10, 100, and 1,000. In some bridges one of the ratio arms has a coil of one ohm in addition to the other three. In the most modern bridges these arms are so arranged as to be interchangeable thus insuring a larger ratio. With this equipment, and forming a part of it, must be a battery and a key for same, and also one for the galvanometer. The battery may form a part of the equipment or it may be entirely separate, as circumstances dictate. The coils (attached to brass blocks or mountings) should be arranged in rows, from 0 to 10 in units, tens, hundreds and thousands, and so arranged as to be available in series, in multiple or a combination of both of these, by means of plugs. The galvanometer may form a part of the equipment or it may be entirely separate, if



TEST FOR CAPACITY

for portable use the whole equipment should be complete, including batteries, galvanometer, etc., and be as compact as practical. If, however, a very sensitive galvanometer is necessary, it will then be necessary to have the apparatus arranged in parts, the whole being neatly arranged in a box for safety.

The sensitiveness of a galvanometer may be defined as the current in amperes required to give a unit deflection, or as the resistance of a circuit containing the galvanometer in which one volt will give one degree on the scale, with the galvanometer scale one meter distant from the mirror or needle. The use of the mirror type galvanometer is necessary in making capacity test of any kind, such as open wires, etc. Such high efficiency galvanometers should be arranged for what are known as "zero" deflections and "direct deflection." The former is used for low resistance testing and in conjunction with the Wheatstone bridge; the latter is used only in the testing of high resistances such as insulation, etc. The coil used for the former should have a resistance of 400 ohms, and the coil for the latter a resistance of about 3,500 ohms, and these coils should be mounted in separate tubes for convenience. The mirror used may be either plain or concave, the former being usually preferred, and using with it a telescope and scale; with the latter a lamp and lens and scale are necessary.

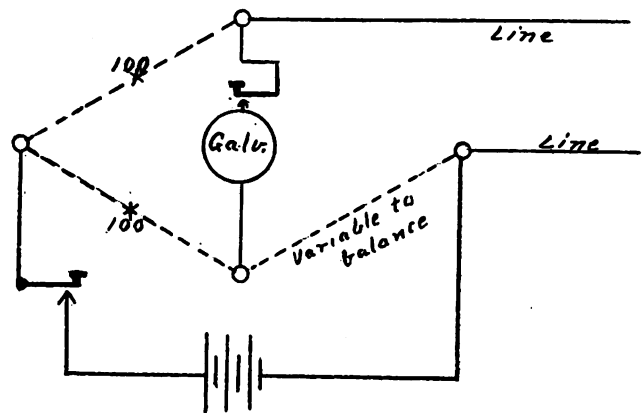
The wire used for galvanometer and shunt coils should be of the same material which permits a uniform change taking place on account of changes in temperature, so that no allowance for such changes would be necessary. If this is not done then some allowance will have to be made in considering the shunting power. For all ordinary purposes such allowance may be neglected. A universal shunt, known as the "Ayrton universal shunt," permits of using it with any galvanometer. These shunts are made in three sizes, 100,000 ohms for a galvanometer of 20,000 or more, one of 10,000 ohms for galvanometers of 2,500 to 5,000 ohms, and one for all galvanometers of less than 2,500 ohms. This shunt, though more expensive, is to be preferred on account of its universal usefulness.

Returning to the insulation test requiring a high power galvanometer and the use of the deflection method:

Probably the best instrument for this purpose is the D'Arsonval. Before beginning such a test it is common practice to make a preliminary test using the one-thousandth shunt. The deflection is then noted and if off the scale it is known that the resistance is low and the Wheatstone bridge method should be used, or it may be possible to reduce the voltage of the battery and still use the deflection method. All that is necessary in such a test is a good readable deflection, and this can be had by a proper regulation of the shunt. In order to verify the tests obtained it is considered good practice to take several readings and strike an average of these. Time should be allowed for charging the magnetic field surrounding the line and caused by the passage of the testing current, such time being slightly longer in the case of cables than in open wire testing, about one minute is the time generally allowed; after such electrification the discharge key is opened and a reading taken on the galvanometer. This deflection we will call  $d'$  and the constant  $d$ , then the

formula would read: 
$$\text{Insulation} = \left\{ \frac{a \times d \times \text{shunt}}{d' \times \text{shunt}} \right\}$$

Where  $a$  is the known resistance,  $d$  the constant and  $d'$  the reading on the unknown resistance, the answer being in megohms. If any leakage is noted before throwing in the battery this may be neutralized in the test and eliminated in the calculations by reversing the polarity of the battery. If instead of the deflection method we decide to use the Wheatstone bridge method, this method is good and reliable up to about five or ten megohms. A good method of doing this is to measure a known resistance, call this  $C$ , then join up the unknown resistance in parallel with this known resistance, making these two parallel resistances form the  $x$  arm of the bridge; now balance in the usual manner and call this  $D$ , then the unknown



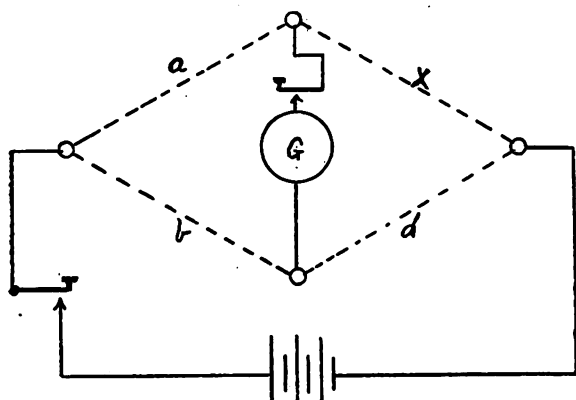
CONDUCTIVITY TEST

resistance will be equal to  $\frac{C \times D}{C - D}$ . The formula for

standard regular bridge work is  $X = \left\{ \frac{A}{B D} \right\}$ ; the resistance desired to be known being represented by  $x$ , and  $A B D$  being the three other arms of the bridge,  $D$  being the rheostat side. It is customary in all ordinary testing to have two arms of the bridge equal, but if finer results are necessary, then an unbalanced bridge may be used, in which case if 100 and 10 were used the ratio would be  $\left\{ \frac{100}{10} \right\}$ . The principle of the bridge is the balancing of

the four sides A, B, D, X, and were all exactly alike and equal and a galvanometer was bridged across the points C E and a battery attached to B F, then no perceptible deflection would be noticed in the galvanometer; if, however, any unbalanced condition existed the surplus current would at once go through the galvanometer and indicate the extent of the unbalanced condition. It is known that the current traversing any circuit is proportional to the E M F or pressure applied to the circuit and inversely proportional to the resistance of the circuit. A consideration of this rule explains the action of the bridge and as there are two paths or circuits for the current to travel, the current will be inversely proportional to the resistance of each one.

It is known that when current flows over a conductor some of its pressure or voltage is expended in overcoming the resistance, etc., of the conductor, and such a loss is termed "fall of potential," and is in proportion to the resistance of the circuit through which the current flows, and is found by using Ohm's law— $C = \left\{ \frac{E}{R} \right\}$  and this together with the fact that a test made with a galvanometer between any two points on a circuit (straight or derived) which have exactly the same potential, no deflection will be observed as no current can flow, these two facts form



SKELETON OF BRIDGE

the theory of the well known and much used Wheatstone bridge, and while the forms in which this instrument are made up or arranged are legion, the underlying principle is the same. Hence, if the resistances are arranged in a parallelogram, as in Fig. 1, and the galvanometer connected between the two middle points as shown, and if three of these arms be known it is at once apparent that the fourth or unknown is a function of the other three and would be found by using the following formula:  $X = \left\{ \frac{ad}{b} \right\}$  or placed in the form of a proportion we find  $a:b::x:d$ , provided a balance has been struck by a variation in the resistance in d and that no deflection is noted in the galvanometer. The equations for the proper handling of special bridges and their various combinations, are generally furnished by the manufacturers.

It is also possible to test condensers by means of the Wheatstone bridge, inserting the condenser in the X arm of the bridge. The capacity of the condenser is made or taken in comparison with a standard capacity or condenser; then capacity =  $\left\{ \frac{cap^1 def^2}{def^1} \right\}$ . If an adjustable capacity is used, then it may be possible to adjust them so that the readings will be exactly alike. The insulation of the condenser may be made by the bridge method. Such insulation is generally high and runs from .5 to 40 megohms. The average 2m. f condenser used in telephone work on central energy systems is from three to four million ohms. If the insulation is over five megohms, it is best to make the test by the direct deflection method. The straight resistance tests of apparatus or line are known as conductivity tests and those of open circuits or apparatus such as condensers, and other high resistances are known as insulation tests, in other words it is common practice to consider any resistance over ten thousand ohms as insulation tests. In addition to these tests, tests are made for capacity (electro-static) and may be made on lines or in cables, as may be found necessary. This electro-static capacity is the power of the conductor to absorb electricity applied to it in current form. The best illustration of this is probably that of the leyden jar or any form of telephone condenser. The effects of applying a current to such apparatus is that electricity is apparently stored in the apparatus and can be proved by discharging the same to ground or through a shunt by means of the fingers, a shock being felt in performing the experiment.

Any condenser consists of three parts, the two plates and the dielectric in the case of telephone lines, the conductor forms one plate and the earth or other conductor of a pair the other plate, and the air or ether the dielectric or in the case of the cable the conductor forms one plate and the lead sheath or other conductors the other plate, and the paper insulation the dielectric. The unit of capacity is the farad, but as this is an enormous quantity of electricity it is never used, the micro-farad (m, f) one-millionth farad being the unit in practical use. The commercial and standard condensers are usually made of two strips of tin foil separated from each other by a layer of paper insulated with paraffine, which also increases the condensing or capacity effect.

It is apparent that if a battery be connected to a standard or other condenser and the current left long enough to charge it, then disconnected and a galvanometer applied to its terminals, a deflection will be obtained and such a deflection will only be of short duration and needs careful watching a repetition of such a test on a standard condenser will show each discharge reading to be the same. Now, if we perform the same functions, using a condenser or line of unknown capacity, another deflection will be obtained, and if capacity is uniform and fixed then several results taken will give uniform results, but if not uniform then several tests will have to be taken and an average of them struck. This method is known as the comparison method in a similar manner to the same method used in the insulation tests. The deflection of the known (or standard) capacity will be to the unknown as the first is to the second. The standard capacity generally used in this test in conjunction with standard apparatus consists of a flexible arrangement having five standard capacities, one of half a micro-farad, two of two-tenths m f, and two of .05 m f. By means of plugs any capacity from .05 up to one m f can thus be obtained. The shunt box is also used in these tests to reduce the deflections on

the galvanometer. The test consists simply of charging the unknown condenser and discharging it through a galvanometer, then repeating the same operation with the standard condenser through the same galvanometer and noting the deflection in each case. The use of a ballistic galvanometer having a heavy needle is to be preferred for the test. The charging of the conductor or condenser must occupy the same time in each case and be about one minute.

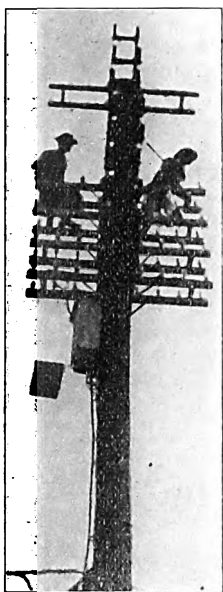
The price of galvanometers vary from \$25 to \$300, according to style, efficiency and finish, the Thompson and the D'Arsonville being the most expensive. A discharge key should form a part of every complete testing outfit and as the action of such must be instantaneous, it is operated by means of a spring move-

ment and is provided with two buttons. The depression of the key allows the battery to flow out on the conductor under test, when the minute of electrification has expired. The left hand key or button is touched and the key automatically opens the circuit and insulates the conductor. By depressing the right hand button the conductor is discharged through the galvanometer. A battery key or reversing switch is also furnished for reversing the polarity of the battery. In making tests of any character the apparatus should be kept clear of dust, all contacts clean and tight and the leading in and lead wires of as low resistance as possible if otherwise then allowance will have to be made if fine testing is necessary. In another article we will consider the location of faults common to telephone systems.

## More About Philippine Conditions

BY CORRESPONDENT

### POLES AND WIRES OF THE WALLED CITY.



Your correspondent having received a number of letters recently from electrical and telegraph engineers of the United States making inquiries concerning the status of the electrical and general engineering profession in the Philippines, the annexed article is presented, somewhat in the form of answers to inquiries, and again somewhat general in character. The walled city of Manila is, of course, the center about which electrical and general mechanical engineering matters hinge. Iloilo, Zamboanga, Jolo and Cebu are not far behind in the race of progress in electrical and telegraphing devices. Manila is the central point for everything, however, and therefore the writer uses the walls of the city, the poles within and just without the walls, and the wires thereupon, as the subject of the story of poles and

wires of the walled city of Manila. The electrical engineering fraternity have been extremely busy in the past year erecting new poles and installing new systems of wires, and the progress has been wonderful. But it will be some time before the olden forms of slightly constructed poles are entirely removed to make way for the big, solid, straight metal or hard wood poles of American design. Wherever these new poles of metal construction, or hard wood are put up by the American engineers the difference between these and the original Spanish poles is very marked. The Spanish poles were very small indeed, compared with the service required of them, and they carried the wires low, and in fact this is the case now, because all of the miniature poles have not been supplanted with the newer types. The electrical lighting poles are probably superior in design and strength to the average poles used for wires. There are a great many new, substantial American made poles for telegraph and signal wires in the city, but not nearly so many as there are old patterns of native and Spanish poles of small size and weak form. Some of the poles for supporting

the electrical lights are of precisely the same design as one sees in New York city or other metropolis.

In the residence district one sees some fine poles for lights. Intervening with the substantial poles it is not unusual to observe the olden designs of poles, liberally bound up with cords, or wires or otherwise braced to keep in position.

### GOOD TREES, TALL AND STRAIGHT, FOR POLES.

Your correspondent travelled through the wooded sections of Isle de Mindanao and other islands of the Philippine archipelago and noticed the abundance of great, magnificent trees, suitable for poles and masts. The fiber is extremely tough, the barks thin, the grain even and the wood extremely hard. Most of the trees grow to great height and a majority of them are of just about the right size in every particular for the making of suitable poles of extreme height, and yet strong enough to resist the heavy blows of the islands, when laden with wires. The straightness of these great poles is remarkable. The Lunata has many poles of this sort in use.

### PRONGS ON TOP.

The Spanish had a custom of putting forked or pronged pieces of metal on the tops or projected into the sides of poles, and each portion of the prong or fork would carry an insulator. These forks can be seen sticking up above everything else on top of poles, or building cornices, carrying four to six wires.

### UNIFORMED INSPECTOR.

The electrical equipment of the city is carefully inspected by detailed men, uniformed, and some of whom ride horses, others wheels, others walk. Since the addition of the fine fire alarm system, the complication of wires on the poles has been greater, and more careful inspection needed.

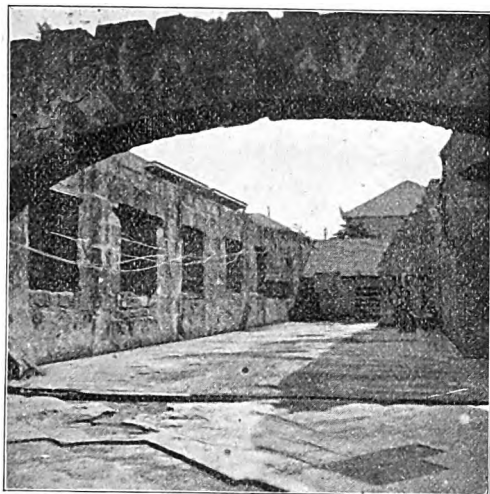
### GIANT AMERICAN POLE AND PYGMY SPANISH POLE.

The Spanish erected extremely substantial walls and buildings here, likewise firm bridges, but when it came to installing their electrical and wiring systems they put up some of the smallest and weakest of poles. The American poles loom high in the air like giants, beside these Spanish and native pigmies. Still the Spanish poles are frequently just as heavily loaded with wires. Some of these native poles are so crowded with weight of wires that they are prevented from collapsing only by bracing with wires, ropes and brackets.



## SPLICED POLE SYSTEM.

The Spanish and Filipino linemen were accustomed to put two or more poles together and bind them with wires, or bolt them together. The doubling up of poles like this adds to their strength, but makes a patched job. The poles of this character can be found anywhere in the city.



WIRES ON THE WALLS OF MANILA

## STRAIN OF MANY WIRES REQUIRES BRACING.

The installation of bracing devices for unduly weighted and strained poles is practiced by the Manila lineman, as elsewhere. The poles in portions of the city carry considerable weight in numbers of wires and often the body of the wire system draws the poles to one side. Therefore bracing is required. Some of the original poles are not sunk nearly so deep into the ground as it is the custom for Americans to insert poles, and bracing is the only remedy.

## MANILA'S OUTING.

The elite of Manila gather along the water front parks at the Lunata each evening to listen to the band concerts. Bands of different regiments take turns in playing for the people. This water front is furnished with as good poles and as fine electrical lighting system as one could wish for. The engineers did good work here.

## IN THE BUSINESS CENTER.

The electrical engineers and linemen find plenty of work in keeping the systems in running order in the centers where commercial interests operate. There is not any too much room in the spaces afforded, and in some cases the walls of the city are used, or trees, or buildings to carry wires. Clouds of wires are found on some of the poles. It is remarkable how these native linemen can make proper selections and work among the wires as freely as they do. They possess the advantage of agility. They can ascend and descend poles like monkeys. They can go out on cross arms and get around places that no one else can. There is usually a white overseer below, however, shouting up to the native lineman what to do and how to do it. But these fellows learn quickly and some of them are first rate linemen.

## THE ELECTRICAL AND MECHANICAL ENGINEER OF THE WALLED CITY.

Manila is the walled city of the tropical climes where the engineers and mechanics have obtained quite a solid footing during the past few years. It is concerning the

grip that the electrical and mechanical engineers have got on the city of Manila and surrounding territory in a professional way that we desire to devote this article. Some three years ago your correspondent arrived here and went south. Upon returning to Manila I found that a vast improvement had taken place mechanically, electrically, and in the steam engineering line. Sanitary engineers had also been steadily engaged. First, regarding the shops, machinery and general facilities of the walled city for mechanical and engineering purpose, will say that although the majority of the shops are just outside the great walls, there walls are by no means a drag on industry. The work of removing the walls in sections is under way by the convict and other available labor. The walls are made very powerful. They are of blocks of stone, and are some sixty feet through and nearly forty feet high, in tiers in places. The mechanical and engineering shops are fairly well equipped with devices at the present writing. American builders of engines, boilers, water wheels, turbines, electrical devices, etc., have been represented here for two or three years and the agents have not been slow in introducing modern contrivances. Among these devices one sees some of the best machine builders of the United States represented with up-to-date machinery and tools. One sees as fine installments of electrical power and lighting plants here as in any city of equal size in the world.

## STILL THERE IS PATCH WORK.

Regardless of the advent of modernized American and other devices you need not look far to see specimens of the olden apparatus erected a half dozen years ago. Take the poles for the electrical and telegraph wires for example. The poles which the Americans have been putting in are models in size, uniformity, smoothness and strength. They are tall and roomy. The old forms of Spanish and Filipino poles are very different, yet many are in use. The average Spanish poles are made of two or more poles of small size bound or patched into one. The Spanish poles are all too small and weak for the work.



LINES OPPOSITE ORIENTE HOTEL

The electrical engineers are fast removing these inferior poles and substituting new ones of modern type and effectiveness.

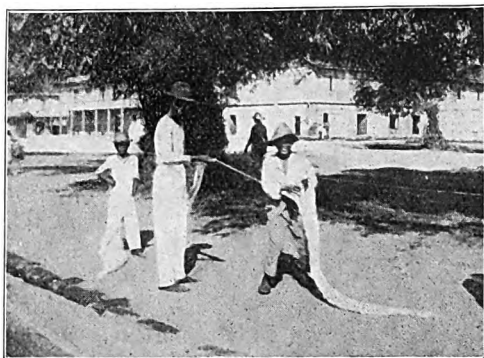
## MOTOR WORK NOW AND THEN.

The electrical engineers of the city of walls are also called upon now and then to do repair work on automobiles. There is quite a sprinkling of motor carriages

in service in the city now and these horseless vehicles may be seen in service by natives, Spanish, Hindoos, and even the Chinese. Americans use quite a number. The result is that nearly all of the men who conduct mechanical and electrical engineering establishments are required to do some adjusting and fixing of these motor vehicles.

#### WIRES, WIRES, EVERYWHERE.

Probably it is the electrical engineer who has to do with the wiring of the walled city that has complications before him. There is an excellent fire department system now in vogue and the chief is fast adopting American methods in every detail. The result is that the bells and hand ropes in the towers of old are done away with for fire alarm purposes and wires are used for conveying the messages of fires from the district of the fire to the fire stations. This required the addition of more wires, and



NATIVE HELPERS MAKING ROPE

in districts where old poles were used one sees quite a combination of wires. There are forty, fifty and sometimes nearly one hundred wires on some of these poles. It has been the Spanish custom to set up two poles at distances of about six feet between, with cross arms, thereby affording a means for bracing. The cross arms are liberally covered with wires, often down quite low, so that top heavy wagons sometimes nearly touch the lowest wires. The wood in some of these old poles is nearly decayed. The government and private concerns are rapidly removing the old poles and putting in new ones of extreme strength.

#### ELECTRICAL AND STEAM APPARATUS ARRIVING FREELY.

Manufacturers of electrical devices in America are shipping a liberal supply of apparatus here. It comes in by steamer, transport and sailing vessel. Boilers are made

here in the boiler shops, and very superior types are turned out. There is engine building in progress, but much of the engine work comes in from American shops. Pumps, mining machinery, mills and the like are in process of construction by the engineers all the while.

#### BIG DREDGERS AT WORK.

Your correspondent saw several large dredgers at work clearing the canals, and also observed one dredger in process of being overhauled quite thoroughly. Most of these shops are in order for doing all sorts of large mechanical and engineering work and they make quite a success of it.

#### FILIPINO MACHINISTS AND ENGINEERS.

The expense of hiring American or other white engineers, electricians, firemen, mechanics, etc., is so great here that most of the shops utilize considerable Chinese and Filipino labor. You will see Chinese firemen and machinists, and even Filipino electricians. There are a goodly percentage of the Filipino and Chinese machinists who can be instructed in the higher arts of the profession, and these few are sought out by the superintendents and foremen and given special lessons in the craft. After a short while they become effective and can be trusted with important positions. They seldom act as foremen unless it is to oversee some of their own people under the direct control of the American general overseer.

#### ELECTRICAL AND STEAM ENGINEERS DOING WELL.

So far as your correspondent was able to ascertain by interviewing American electricians, engineers, telegraph operators and others, these people are doing well. Most of the electricians or engineers upon arrival here either open offices in the city or in the provinces, and do contract work, or engage with the government or private concerns at a salary. Some establish shops and begin electrical and mechanical work. There is considerable farm implement machinery being made.

Machinery for working the hemp product is desired. Weaving and spinning devices are mostly of wood construction and there is great room for improvement. The working of the cocoanut product into oils, copra, etc., is one of the rich industries, and considerable new types of devices are being made by the shops for the cocoanut people.

The lumbering interests are likewise bringing much business into the hands of the engineers of the walled city. Then there are the electrical installations and related work which are being developed

## How to Check Bell Tie-Ups

F. E. EBERSOLE

The subject is a rather difficult one to handle from the fact that in almost every case the remedy required is different.

We all realize that one of the most important things to the Independent operator is to maintain an unbroken chain of Independent companies in the territory surrounding that in which his exchange is located.

The Bell companies realize that one of the most vital points for attacking an Independent organization is through what they term their sub-license contract. The method of procedure on the part of the Bell company

is not a general plan of attack upon every Independent organization in a state or a given district, but they proceed to pick out some company located in a certain territory which is more or less tributary to all of the surrounding territory and try to secure a sub-license contract with that particular exchange. It is not material to the success of their plan that they secure the neighbor of that exchange, and, in fact, I am inclined to believe that they would rather not sub-license the additional exchanges in that immediate vicinity at that particular time. When they secure a contract in a case of this kind, they have



broken the connection between several Independent companies through the fact that the toll lines connecting these several companies all center in that one exchange.

Thus they have crippled the Independent movement to a greater extent than they could have done in any other way, and you can readily see that the results obtained by them in tying up six or seven Independent exchanges scattered over a considerable territory will do more to retard the growth of the Independent movement than could have been accomplished by any other method in a much longer period of time.

The smooth tongued, oily solicitor or sub-licensee agents, as they are known, of the Bell company, pick out one of the weaker companies in a territory in which they expect to begin operations and about the first move they make is to create an impression among the business men of that locality that they would be far better served could a connection to their telephone service be secured, and an outlet into some large business center at some distant point where the Independent lines have at the present time no connection. Very frequently, when trying to induce some of the merchants in these towns to see the matter to the liking of the contract agent, it becomes necessary to do more than simply talk to the gentleman to get him to see matters in the proper light, and the writer has known of cases where the inducement held out to have the gentleman in question see the matter in the proper form has been large enough to cause most any ordinary man to begin to use some influence. Soon after several people have been lined up properly, and commence to complain for this connection, the owners of the exchange are approached and alluring inducements held out to them to become sub-licensees of the Bell company.

The advantages are set forth that will accrue to them by making such a contract such as toll line connections to New York, Boston, Chicago, Buffalo, Cincinnati, New Orleans, and a few other points where their customers will want to be carrying on extended conversations which is beyond their reach at the present time, and, as a general rule, the fact that the sub-licensee company will be able to consult the engineering department of the monopoly without cost and thereby be able to apparently better their condition by having access to this long accumulated wisdom which can be gained from that source, and many other statements which would hardly hold water, were they properly sifted out. And, of course, if the Independent people who are interested in this particular vicinity take no note of what is going on with their friend and neighbor, the chances are that the Bell people are successful with their plans after a reasonable time has elapsed, and succeed in closing a contract with the Independent company, and thereby breaking a connection of the Independent companies in that vicinity.

And, while it is a fact that this break is generally of short duration, it requires new energy, more money and lots of hustling to fill this gap and which could have been expended to a better advantage in some other part of the field, and would have caused the Bell company greater grief than if expended to repair a break made by them.

One of the first things that occurs to me when I hear of some company that is contemplating tying up with the octopus is that a short while before, perhaps a year, three, or five years, this same crowd of men organized a telephone company in their particular vicinity to get relief from the very people with whom they are now considering making a business agreement. At the time they

started their organization they were in either one of two conditions. First, without telephone service of any kind; or, secondly, with the poor inefficient so-called telephone service at rates that were exorbitant beyond all reasons, which made the telephone an expensive luxury to a few, and beyond the means of the mass of people in that community. Generally these gentlemen who organized this company were progressive, public spirited citizens who did so first from the fact that they saw therein a chance to make a good investment, and, secondly, to help a suffering public and give them a telephone service within the reach of all the people at a rental price that was equitable to both sides.

If this plant was built in a community, as sighted first, where there was no telephone service furnished, and there are any gentlemen within hearing of my voice today who tried to secure telephone service in that community from the company then operating, they will know the result of their efforts along those lines. They were informed that the community was too small to support a telephone exchange, that there would not be enough people who could afford to pay the price asked to justify the company coming into the field, or they would have been there long before.

If built in a town under the second condition, where there was a competing exchange, these same gentlemen will know that at the time they started their plant the service of the Bell company was poor, in fact abominable in most cases; that the telephones in use were few and far between; and that the rates were exorbitantly high. They know that after they made their fight the Bell company could afford to give free service could afford to hold out any inducement to throttle them in their desire to benefit the general public with a first-class telephone service in that community; and they also know what loyal support the citizens in those communities gave them where they made this dual investment in a field which the Bell people claim should only be operated as a natural monopoly. And those companies who have had the back bone to stick the fight out, will know that in the end the Bell company lost in this fight, and that during all this period there were no overtures made to them to sub-license an exchange; but that after the fight has been won the Bell company, as philanthropists, come to take a new turn at their throat by putting up the same old game in a new way, namely, a sub-license contract. They hope to be able to do under cover that which they could not do in the open.

It was this condition that existed in all parts of the United States that has brought about the advent of the Independent telephone. That has made the telephone a necessity, not only with the business men, but with the people who reside even in the rural communities; and in this country today the Independent people have more telephones in use than the combined Bell companies. The Bell company sets up the claim that a telephone plant cannot be operated successfully at the rates charged by the Independent people, yet they are very willing and glad to tie up an Independent telephone company to operate at these rates, and take their toll business at a percentage that is less than the actual cost of handling same, and to have them receive and deliver from the Bell company all incoming messages absolutely free of charge. In other words, they take the cream of the business, and have the owners of the Independent plant hold the sack while they harvest the earnings that have been created by the terminal facilities owned by the sub-licensee.

It seems strange that the owners of any company will give an ear to these alluring inducements held out by the Bell people after they have accomplished the purpose for which they were organized; and that at a time when they have the enemy down and out, will allow him to come back to their camp, as a wolf in sheep's clothing, and take away the rights and prestige they have acquired, and eliminate all chances they may have had to pay a reasonable income on their investment.

Let us see what an Independent exchange could possibly hope to secure by making one of these contracts in any of the counties in this district. In the first place, the Bell company in this territory have less 'phones in every county in the South Platte country than those of the Independent, and when they make such a contract they isolate their subscribers from the balance of subscribers of Independent telephones as in their territory and instead of giving them from 1,000 to 2,000 telephones as before, it is only possible when they connect with the Bell to give them from 500 to 1,000 telephones in the vicinity so that they do not gain anything in that direction. By reducing the number of 'phones that their subscribers are able to talk to, within a radius of twenty to thirty or fifty miles of the exchange, they thereby reduce the earning capacity for long distance service in that exchange, and as 90 per cent of the toll business is conducted within a radius of fifty miles of the originating point, they cannot hope to secure enough additional long distance business to overcome the loss that has been made by entering into this contract.

The percentage accruing to the originating company entering into a contract with the Bell company is 15 per cent of all money collected for toll business originating in their exchange, and they are required to guarantee the collection of all toll charges. They receive no compensation for incoming messages. Should they remain Independent, they have the advantage of a constantly increasing list of subscribers in their vicinity and a constantly added and extended toll line service with an originating percentage of 12½ per cent and a terminating percentage of the same amount, thereby making 25 per cent of the gross toll business originating and terminating with them.

They have the right to build, operate and maintain toll lines of their own, and are enabled thereby to secure further earnings to their exchange that is impossible to secure under a sub-licensee contract. They are forced to pay to the Bell company a rental of about 50 per cent of the costs for at least a few transmitters and receivers each year, and are turning into the coffers of the Bell monopoly money which is taken from the state, thereby working a double injury to the community in which they are operating.

The remedies to prevent these tie-ups from taking place are very numerous, and, in fact, almost every case requires more or less of features that were new to any preceding one. It is possible for the Independent people interested in preventing the tie-up, to show to the company about to affiliate themselves with the Bell organization that instead of making prestige they are losing the same from the fact that it is a hard matter to find a county in the state where the Independent 'phones do not outnumber the Bell, outside of Douglas. The toll lines they are about to connect with are, in most cases, inferior to, or at best equal to those that they are at the present time connected with. The interests of their

friends and business associates are more or less directly affiliated with the Independent movement and it works an injury to others who have been induced to enter the Independent field through their having been there.

But this is all mere sentiment. The actual remedy lies in the organization of a long distance telephone company in this state that will build a first-class long distance telephone line connecting every county in the state with every other county and furnish the required number of circuits to handle the business; give the proper outlets, good service, and allow all companies now operating to become stockholders. Another feature that is of vital importance to every operating company within the state, is to see that every company with whom they are connected by toll lines, signs a contract with them for a reasonable number of years to insure uninterrupted connection with the exchange. Had such a contract been demanded of all companies going into the field the history of the Bell tie-ups in the state of Nebraska could have been recorded in a different manner from what it is at the present time.

If every company represented here today will proceed to contract with every other connecting company they will have formed a barrier which the Bell company cannot break down and which will force all companies to receive and deliver all messages from any other company in the state.

In union there is strength, and it is the lack of this union and organized effort on the part of the Independent people of Nebraska today that permits these conditions to exist. We little realize what it means to have a company sub-licensed to the Bell as long as this company is in some isolated territory from our own territory; but when the matter comes home to us, and we find the fellow with the large exchange in the next county to ours tying up with the Bell company, shutting off connections and eating a large hole in our revenue, we begin to realize it is a pretty serious matter. Had we expended the same amount of energy and time at some earlier period, or at the time we made the first connection between our exchanges, that we are willing now to expend to prevent this action taking place, we could rest secure in the thought that it is impossible for the Bell company to sub-license any of the companies connecting with us; and, in my opinion, the safest and surest way to prevent this condition from taking place, is the immediate closing of contracts such as I have mentioned, between yourselves and every company operating in your vicinity.

[Read before the meeting of the Nebraska Independent Telephone Association held last month at Hastings, Neb.]

There is a press report to the effect that a telephone manufacturing plant will be removed from Georgia to Rochester, N. Y. Rochester capital is reported to be interested in the proposed deal. If the factory is established, it will compete with existing concerns, but the report further states that not much progress has been made as yet in the negotiations.

The *Leader*, of Des Moines, Ia., says that there is a report to the effect that the United States Independent Company may absorb the Mutual Telephone Company of Des Moines. The report further states that the United States Independent Company will unite all the Independent toll lines of the country. The authority for the report is not given.

# Future of the Independent Telephone Movement

CHARLES WEST

Although this paper is to treat primarily with the future of the Independent Telephone movement, it will perhaps be well to begin with a brief history of the starting of the Independent movement. You are all familiar with the original telephone invention of A. G. Bell, and I personally remember the wonder the instrument caused when first exhibited at the Electrical Exhibition held at the Crystal Palace in England some twenty-five years ago.

For many years the great "Bell" monopoly through its basic patents controlled the entire telephone situation, charging outrageous prices for poor service, with inadequate apparatus and practically had the entire population of telephone users in the hollow of its hand.

The tactics pursued by the Bell Telephone company at that time naturally were objected to by the enlightened people of this country and they in time began to cast about to find a remedy. For a long while they could see no ray of hope and as the tendency was to charge higher prices and to dictate more onerous conditions the public began to despair. But, it is always darkest just before the dawn," and the day of salvation was at hand.

In a quiet and unostentatious way various men of brains and genius had been quietly working out their plans and designing new and better apparatus, and when at last the patents owned and controlled by the Bell Company expired, they were ready to proceed with their ideas and there was started at that time the first Independent Telephone Company, which has risen by leaps and bounds into the present splendid organization, that we all present here represent and which we are proud to belong to.

The installation of the first Independent system was in the western part of this country, and in the East it is claimed by many towns, but so far as I am able to discover the credit belongs to a little borough called "Honesdale" in Wayne County in this great commonwealth.

From that time on the industry has been steadily growing until now practically every large city in the United States has or will have in the very near future its own Independent telephone plant with its feeders in the shape of toll lines running out into every little village and hamlet, and thus putting them in touch with their markets of supply. What a difference a few years has made. We have now up-to-date apparatus, central energy switchboards and far reaching toll lines, but we must constantly be going forward and that brings us up to the important matter before us, "The Future of the Independent Telephone Movement."

I do not wish to pose before this convention as a prophet, but I do think that we can take up some matters at this time that will be instructive and valuable to us all. It appears to me that we are not increasing our business in the East as rapidly as they are in the West and one of the most important things for us to do is to educate the people to the value of the Independent 'phone. This can be done in many ways and nearly everybody has his own ideas on the best methods of doing this, such as advertising in various ways, free service, etc. We have got some mighty and convincing arguments on our side, one of

which is the large excess of our 'phones in use over the Bell Company, resulting in the users of our service being able to reach a far larger number of people. Of course we must realize the fact that at this time we cannot reach them all, which means that we must lose no time in building new, and extending our present toll lines to weld all of the various systems into a complete unity, so that we can reach all of the people North, South, East and West. We are all doing our share in this particular but we must work together, hand in hand, for, "In Union there is Strength," and a long pull and a pull altogether is very necessary to accomplish the results that we are all aiming at.

A most important point to my mind is a "Universal Emblem" that we may all know. Everybody knows the blue "Bell" stands for a monopolistic telephone and we want everybody to know when they see a certain emblem that it represents an "Independent" 'phone. At the last convention of the National Inter-State Telephone Association, this was impressed very strongly upon the delegates and after discussion an emblem was adopted and I think that all companies should endeavor to install it at an early date.

The large companies throughout the state should endeavor to get the small companies to build their lines properly so as to give good service and should make a strenuous effort to get the small rural lines to connect with them, for while the returns may be small we must recollect that every new point we reach helps us to get new subscribers in the large towns and means an increase of toll business.

It seems to me that all Independent Companies must look to the toll revenue for their surplus earnings as the present low rates for subscribers service do not leave enough margin over and above the cost of operation, maintenance and depreciation to pay many large dividends, therefore special and earnest efforts to increase this part of the business should be made and inducements offered to the subscribers so as to get them to use the service. Coupon books at attractive rates of discounts can be prepared, good in any Independent territory and accepted by any Independent company in payment of long distance messages, and I am sure this will be a great inducement to large concerns. Many of the companies represented at this convention are now issuing these books and are getting good returns.

I am of the opinion that it will not be long before telephone service is placed upon the same plane as gas and electricity, that is, the measured service basis. The sale of electricity by contract is almost a thing of the past and when a satisfactory telephone service meter is perfected, telephone service can be sold very much along the same lines and in that event there is no reason why practically every household should not have a telephone installed.

There are a great many other matters that could be brought up at this time but every company has its own methods of producing and increasing business and we are all working together for the common welfare, and an interchange of ideas from time to time would be of benefit to all.

In conclusion I think that it must be clear to all that

this splendid state of Pennsylvania with its enormous natural resources of hard and soft coal, oil fields, iron mines, cement mills, slate quarries, and numberless manufacturing industries is destined to become one of the largest users of Independent telephone service in the country and we should all earnestly strive to make the individ-

ual companies we represent an important factor in the development of the territory and help to make the "Future of the Independent Telephone Movement" an assured success.

[The foregoing paper was read by Mr. West, before the annual convention of the Pennsylvania Independent Telephone Association, held last month at Pittsburg.]

## District Meeting

W. J. STADELMAN.

The secret of success in big undertakings is perfect organization, and since the Independent telephone movement has grown to be a big undertaking, organization is important and the accentual issue before the operators.

A perfect state organization is almost impossible as long as the telephone companies are so scattered and are dependent entirely upon their own resources for support, owing to the scarceness of toll lines to furnish a closer relation and an interchange of business. Therefore, the only salvation for a betterment of conditions at the present time is the establishment of district associations to be governed and under the jurisdiction of the State Association.

I wish to set forth a few of the benefits to be derived from such associations. In the first place, the districts should not be divided into counties or by lines drawn across the state, for in either of the above instances two or more companies doing a large toll business between themselves might be separated from their close alliance that has already been formed, by these same companies belonging to different associations. This would not jeopardize the toll business, but it would prevent the operators from becoming acquainted with the wants of the various companies within their immediate territory. Therefore, I would suggest the grouping of companies according to the manner in which they are situated or connected with toll lines. For instance, Holdrege, Hastings, Grand Island and Kearney might comprise one district, which should include all the towns tributary to these towns that can be reached successfully from the two farthest points.

The exchange operators within the district could check their through messages each morning, and thus avoid a collection of disputed messages, to be settled by a clearing house at the end of each thirty days. This arrangement would simplify matters, produce quick results, and would give the state clearing house an opportunity to handle the messages at a minimum.

Again, with district associations, the owners, managers, stock holders, and in fact all that are interested could have frequent meetings, thereby becoming not only personally acquainted with the wants and needs in their respective localities, but they could locate the weak places and the weak kneed and give general strength to all. Results can be produced that are absolutely impossible with only a state organization.

Maps can be easily made showing the metallic lines, whether copper or iron, grounded lines, whether farmer or toll, and all stations reached. Reports can be made giving the exact number of exchanges each company owns or operates, number of telephones, whether local or farmer, the rental received, number of miles of toll

and farmer lines each company owns or that they connect with or do switching for. Also, a correct report of the financial strength and condition of each company.

Exchange operating rules can be adopted so that each and every station receives and answers alike, not only for the convenience of the long distance service, but for the local subscribers as well. On this point the Independent telephone companies are very weak and many complaints are heard from people who are accustomed to a uniform service.

Just think for a moment, what great results could be accomplished if the state was organized with six or eight districts, each with all the information completely compiled regarding the conditions, also the conditions of the Bell Telephone Company within their district. Then in time of need, such as the procuring of the franchise in Omaha, what an easy matter it would be to correspond with each district and get the revised facts and figures that are absolutely correct.

To prove that this work can be accomplished, there now exists an association in central Nebraska that can furnish all information relative to their territory, also a true map of their lines. This association is less than a year old and the members have been seriously handicapped in their efforts from the fact that they have been compelled to plan their organization according to their own idea as there is no other district association in the state from which to copy and the telephone journals, with the exception of the past few months, have not discussed state or district association in detail.

One of the most important things accomplished by the association that I speak of is the binding agreement arranged by F. W. Ashton of Grand Island and Warren Pratt of Kearney, between the companies, and I have a copy of the same which I will read.

"This agreement made and entered into this — day of —, 1905, by and between the Grand Island Telephone Company of Grand Island, Kearney Telephone Company of Kearney, Hastings Telephone Company of Hastings, Farmers' Home Telephone Company of Shelton, Kenesaw Telephone Company of Kenesaw, York County Telephone Company of York, Central Nebraska Toll Line Company of York, E. C. Krewson of Elm Creek, Phelps County Telephone Company of Holdrege and Chapman Telephone Association of Chapman, Nebraska, witnesseth:

"Whereas, said parties hereto are members of the Central Nebraska Toll Association, a voluntary organization formed for the purpose of building up and extending the toll business between the various Independent telephone companies in central Nebraska with

the view of destroying the monopoly now held by the Nebraska Telephone Company and competing with it in the toll business, and,

Whereas, each party hereto owns and controls toll lines connecting its exchange with other exchanges operated by Independent companies and is desirous of extending its business and competing with the Nebraska Telephone Company, and,

Whereas, in order to induce the parties hereto and others to invest money in toll lines it is necessary to give assurance that no toll agreement will be made with the Nebraska Telephone Company whereby the toll lines built by Independent companies will be robbed of the business, and,

Whereas, the Nebraska Telephone Company is using every means and offering every inducement to Independent companies to contract with it to give it all the toll business and continue the monopoly now held by it,

Now, therefore, be it agreed, That the parties hereto in consideration of the mutual promise made herein to be kept and performed by each, shall perform the following:

First. Use their best efforts in promoting the business of the parties hereto and assist in building up the toll business of the Independent telephone companies in the state of Nebraska.

Second. To exchange business with each other during the life of this agreement and to build up the toll business of the Independent companies generally.

Third. To refuse to exchange business either directly or indirectly with the Nebraska Telephone Company and to discontinue doing business with any Independent company that does exchange business with said Nebraska Telephone Company.

Fourth. To aid each other in the fight with the Nebraska Telephone Company whenever possible to do so.

Fifth. To abide by the terms of this agreement for the period of ten years, and it is mutually agreed that in the event of any party hereto violating the terms of this agreement then all other parties hereto shall contribute to a fund to be raised for the purpose of compelling the delinquent to fulfill its agreement.

This agreement is made for the purpose of uniting the Independent telephone companies in this state and for the purpose of building up an organization strong enough to compete with the Nebraska Telephone Company and to destroy the monopoly now held by it in the toll business, and for the further reason that the policy of the said Nebraska Telephone Company has been to destroy its competitors and wherever it has done so the telephone service furnished the public has been very poor and the cost of the same has been unreasonable.

It is further agreed that each party hereto shall execute this agreement separately, and when so executed shall be binding, whether adopted by all the parties hereto or by only part of them.

In witness whereof the said company has executed this agreement and caused its president and secretary to sign its name and to affix its seal hereto."

If agreements of this nature existed between the various companies, their relation would be more binding, and Bell tie-ups less frequent.

The operators in the eastern part of the state have been benefitted very greatly from the fact that they are officers in the State Association, which has enabled them to meet frequently and discuss their conditions. Also, from the fact that their territory is connected with good toll service, and the same benefits could be derived throughout the state if divided into districts.

In conclusion will say, that I believe it would be a wise plan for the State Association to procure the service of some able man to canvass the state and organize it into districts.

## Electrolysis on Cable Sheaths

F. LUBBERGER

Every man who is responsible for the health of the underground cables is very anxious to be safe from any damages to the sheathing of his cables, as a slight injury will at once result in a great trouble and sometimes great expense. At present not much is written about the subject of electrolysis on cable sheaths. Still, every manager ought to be up to date in this branch of his many-sided duties. Inquiry and information from quite a number of well known cable men and construction men convinced the author of this article that not everybody has correct ideas. I am going to show that some of the most used means of supervision are faulty. They give the manager a feeling of safety, although the principle is wrong. In order to be clearly understood the subject must be developed from the elements, but not too much space will be devoted to their introduction.

An electric current flowing from a metal piece to

a liquid or moist body touching it will dissolve some of the metal, carry it away and deposit it where the current enters again a solid. This phenomena is called electrolysis. There are two fundamental laws called Ohm's law and Faraday's law, containing everything necessary to form an opinion about the existence of electrolytic currents.

The well known Ohm's law is given in the expression  $E=CR$ , where  $E$  denominates electric pressure,  $C$  electric current and  $R$  resistance. The controlling factors are the pressure and the resistance; the current is the product of the two. For our purpose only the current is of interest. The second law, i. e., Faraday's law, reads  $m=f \times c \times t$ ;  $m$  is the amount of metal carried away,  $c$  is the current measured in ampere and  $t$  is the time;  $f$  is a number depending on the kind of metal. The formula translated into words says: The dissolved amount is proportional to the current and proportional to the time, one ampere flowing for one hour dissolves (practically) .035 ounces of cast iron, 2 amperes flowing one hour dissolves .070 ounces, or 1 ampere flowing three hours dissolves .105 ounces,

etc. Experience has shown that other metals are acted upon more violently. The ratio is practically: Cast iron to wrought iron to lead as 1 to 3 to 7. In words, one ampere flowing one hour dissolves .035 ounces of cast iron, three times .035 or .105 ounces of wrought iron, and seven times .035 ounces or .25 ounces of lead. The lead is for us the most interesting metal and we will keep in mind that one ampere hour means one-fourth ounce of lead.

The kind of liquid or moisture in which the cable sheath is imbedded is also of some importance. Pure water is of very high resistance; with small electric pressure only small currents can be generated. Acidulated water or salt water has very much less resistance, so the same small electric pressure (hereafter "voltage") will cause heavier currents to flow.

A curious phenomena shows up when current is flowing from a metal to a liquid. By the way the liquid is called electrolyte. A reverse pressure, the so-called counter electromotive force, is created. A good many people think this to be a very fortunate thing, as the reverse force acts against the generation of current. In a testing tube anybody may observe that hardly any current will flow if the voltage between metal and water is less than two volts. As soon as the voltage is raised a considerable current is noticeable. Very often it is reasoned, as long as the voltage between the cable sheath and the surrounding ground is less than 2 volts no current can flow, and the cables are safe at lower voltages. This idea is totally wrong. Put a piece of copper in a solution of bluestone (copper sulphate) or copper chloride. You may dissolve the copper with the smallest voltages. In the ground underneath railroads salted in winter, any sorts of chlorides are formed, sulphates and nitrates are abundant everywhere. Do not depend on the hope that counter electromotive forces guard your cables.

If we wish to study the currents that are dangerous for the cables we have to investigate four points: The origin, the intensity, direction and the action of the current.

#### THE ORIGIN OF ELECTROLYTIC CURRENTS.

If any electric pressure exists between two points of the ground, electric current will flow, because the resistance is never infinite. If between two such points a cable is stretched, its sheath will carry current. Electric pressure may be created by many different causes. An electric power plant may be badly insulated at two or more points, large pipe systems as water and gas pipes may reach into sections of different chemical composition, pipe and cable systems may be placed in different depths, as that thermal electricity be developed, and finally long electric conductors as rails of street car systems may have contact with the ground. This last point is usually considered as the only source of troubles, but you can not blame a street car company without previous investigation, and if you fix your cables perfectly regarding the street car rails some other offender may appear without your suspecting him.

Some time ago I made measurements on an absolutely isolated pipe system. A group of farm houses was situated on a high plateau of several square miles. The ground was granite without water. The pipes came up from the pumping station seven miles away. The nearest electric road was five miles from any part

of the pipes. And yet a current of about five-hundredths of an ampere was continuously flowing in the pipe. Another very instructive experience I made in a city of about 100,000 inhabitants. The power house of the electric road was situated away at the east end, the car traffic was entirely shut down from 1 o'clock to shortly after 3 o'clock in the morning, I had my instruments connected to the pipes at the west end about two and one-half miles distant. The instruments were absolutely steady, showing only the steady currents as also found in above mentioned isolated pipes. At once at about 3 o'clock they began to swing around and to show the influence of the very first car leaving the barn two and one half miles away. It is one of the strongest appeals to the reader not to feel too safe if electric roads or light plants are some distance away. His cables absolutely need supervision.

#### THE INTENSITY OF ELECTROLYTIC CURRENTS.

We keep in mind that one ampere hour means  $\frac{1}{4}$  oz. of lead. The damage depends, of course, largely on the surface from which the current escapes. Suppose you find at a certain spot a current of one-hundredth of an ampere, half a mile further out you find nothing, and between the two points the readings diminish gradually. The current escapes from a surface of one-half mile—2,600 feet—length and the circumference of the cable; suppose the cable sheaths to be 6 inches around and one-eighth inch thick. A foot of this sheaths will weigh about two and one-half pounds—forty ounces. The current escaping per foot cable is  $\frac{1}{100 \times 2600}$  in a year or about 8,600 hours, a total of  $\frac{.25 \times 8600}{100 \times 2600}$  ounces—about  $\frac{8}{1000}$  ounces will be dissolved per foot and year. Of course

this figure is only a means of illustration, and if you find so small currents you may be satisfied. In a large Ohio town where a very careful manager rules I found much larger currents in the cable sheaths.

But, now assume that your readings show that the whole 1-100 of an ampere escapes from a length of ten feet. Then the same figuring will show that two and one-tenth ounces are carried away per foot and year. This would mean that in about twenty years of steady escaping current the whole sheath would be eaten away. More alarm is justified if even a small current escapes at a single spot. The reader sees already what he will have to look after, it is the intensity of the escaping current per foot length of the cable sheaths. It does not make any difference how much current is flowing inside of the cable sheaths, the endangered spot is at the place where the current escapes.

#### THE DIRECTION OF ELECTROLYTIC CURRENTS.

In almost every publication on the subject of electrolysis one can read that the next neighborhood of the street car power houses is the most dangerous section. There is a good deal of truth in this statement. Usually the current flows from the trolley through the motor to the rails, then through the rails back to the power house. Currents escape from the rails and spread all over the ground. Some part also enters water and gas pipes and cable sheaths. The tendency is towards the power house. Blotting rails and cables on a map will be a great help to an investigation. This consideration is not sufficient, however. You may run against the oddest perplexities. In Jersey City some years ago three pipes were ly-



ing parallel to a railroad track, the first pipe at a distance of about four and one-half feet, the second of six feet, the third of nine feet. Current was flowing from the rails to the first and third pipes while the pipe between the two outside ones was also supplying current to the outside pipes, i. e., was acting just reversed from the other pipes. One night I had been studying this question of the direction of electrolytic currents.

There was a long interurban track with a pipe parallel to it. The power house was at the east end. The instruments showed a current in the pipe flowing sometimes eastward when the car approached from west, sometimes westward. After the car had passed not much was changed, the instruments were very unsteady, flapping soon to plus, soon to minus. Even in this ideal simple case no regularity could be found.

It should not be overlooked that many street car companies attach cables to the rails in order to provide better conductors between the rails and the power house. Each of these points, where such "return feeders" are connected on, must be considered as a very dangerous spot and should be watched with great care.

When determining the direction of the currents the main object is to find where the current leaves the sheaths.

#### ACTION OF THE ELECTROLYTIC CURRENTS.

Many fold are the freaks of the electrolysis current.  
(To be continued.)

Partially they are humorous, e. g., in Brooklyn it is said that electric lights are switched between gas and water pipes. Of course the light company does not get anything for it. Door bells and annunciators are often run by using the gas pipe as one polarity, the water pipe as another. As to cable sheaths no action is of interest except the destruction by dissolution. Every telephone man knows about the troublesome noises when electrolytic currents or, as they usually are called in this case, stray currents, get some how into the wires. With grounded lines the noise can not be prevented. With metallic systems in cables the escaping railroad currents will hardly be noisy even if they enter the cable sheath. Not so very long ago an interesting discussion was going on about a disturbance of the telegraph cable from London to Cape Town. The African end of the cable was paralleled for a few miles by an electric road of Cape Town. Any car running on this line made the signals unreadable. A syphon recorder is a very sensitive instrument, but a receiver is certainly more so. Under very unfavorable circumstances it may happen that noises are induced from the sheath to the wires.

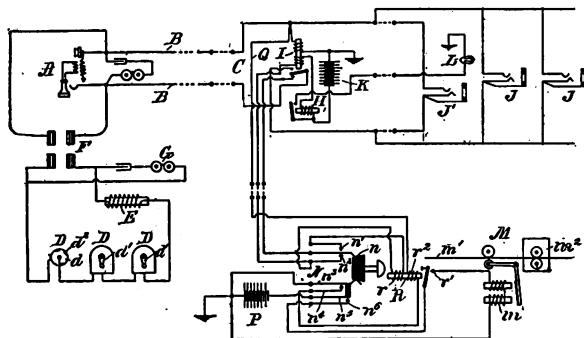
To what extent damage can be done and was done to cable sheath it is not the purpose of this article to describe. Many managers will know about that more than they like to, anyhow.

## Recent Telephone Patents

William Geckler, of Rochester, New York. Telephone night-watch system, patent No. 803,890, November 7, 1905.

This invention relates to improvements in auxiliary signaling systems designed to operate in conjunction with existing telephone lines without interference with the regular telephone service of such lines.

The principal object of this invention is to provide



No. 803890

an extra revenue to telephone companies by operating a night-watch system in conjunction with the existing telephone connection between the company's central exchange and a subscriber's station.

It consists of the combination with a telephone line leading from a subscriber's station to a central exchange, of signaling devices located at said subscriber's station, means to connect said signaling devices across said telephone line independently of the subscriber's telephone

instrument, a signal recording device at the central exchange and a source of current for operating the same, a relay for controlling the operation of said recording device, said relay adapted to be normally excited by current from the line signaling current source at said exchange and to be excited by current from the cord circuit of said exchange when the line signaling circuit is broken by the insertion of the operator's plug in the answer jack, and an operator's switch device adapted and arranged to maintain the normal line signal circuit, to connect the windings of said recorder relay in their respective circuits and to connect the recorder operating current to said recorder relay.

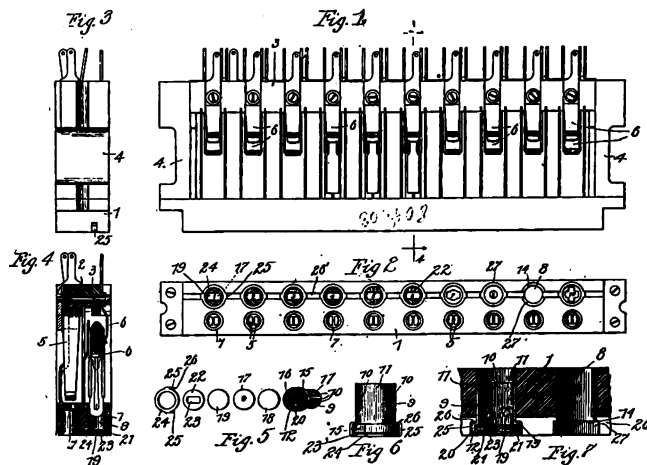
Thomas Vivian Davis, of Kansas City, Missouri, assignor to the Stromberg-Carlson Telephone Manufacturing Company, of Rochester, New York, a corporation of New York, patent No. 804,103, November 7, 1905. Telephone switchboard apparatus.

This invention relates to switchboard apparatus and its object is the provision of an improved device for coloring or intercepting in various ways the rays emanating from a visual signal employed on a switchboard whereby to indicate to the operator the line or circuit with which the visual signal is connected.

It consists of a visual signal in the form of a lamp, of an opening disposed before said lamp through which the rays therefrom may pass, and screens adapted for insertion in said opening, said screen being provided with openings therethrough to permit a path of differently colored rays in which another and distinct signal may be displayed.

Francis W. Dunbar, of Chicago, Illinois. Telephony. Patent No. 803,676, November 7, 1905.

This invention relates to telephony, and has for its object the provision of an improved telephone system wherein the operation of receivers or receiving windings at the sub-stations of the various lines of the system may

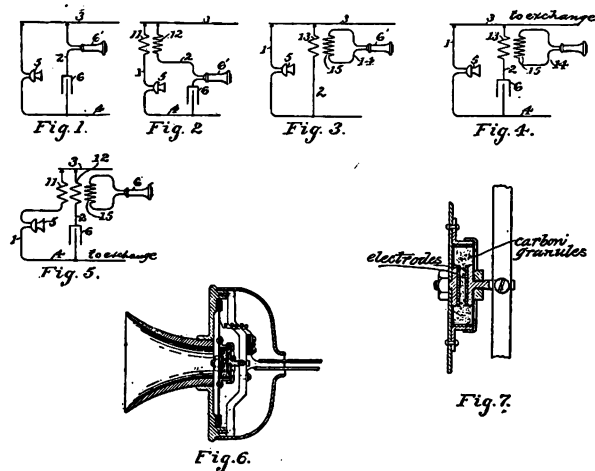


No. 804,103. See Preceding Page.

be substantially uniformly effective irrespective of line resistance and wherein voice currents impressed upon a telephone circuit at a sub-station will not encounter the impedance offered by the receiver at said station.

This invention relates more particularly to common battery telephone systems, wherein it is enabled to secure not only a proper control of the line and supervisory signals, but also an improved association of the subscribers' telephone instruments with the telephone lines and the common or exchange batteries.

It consists of a common battery telephone exchange



No. 803,676.

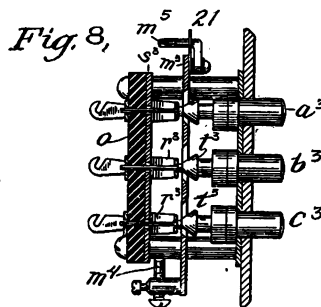
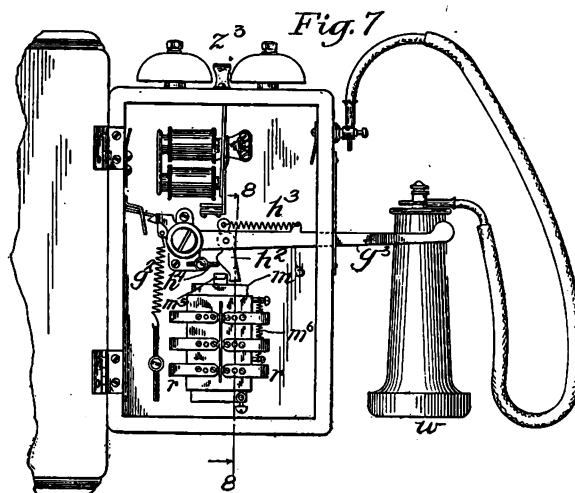
system having lines extending from subscribers' stations to an exchange and there connected in circuit with battery, each subscriber's station being equipped with two conductors of substantially the same impedance in bridge between the two sides of the line, one conductor including a condenser, a receiver subject to current in said conductor, the other conductor including a variable and high resistance transmitter including carbon granules, and a switchhook serving operatively metallically to connect and disconnect the sides of the telephone line at the subscriber's station and operatively metallically to connect

the transmitter with and disconnect it from the telephone line.

Albert S. DeVau, of New York, and Charles Auth, of Brooklyn, New York. Intercommunicating telephone system. Patent No. 794,790, July 18, 1905.

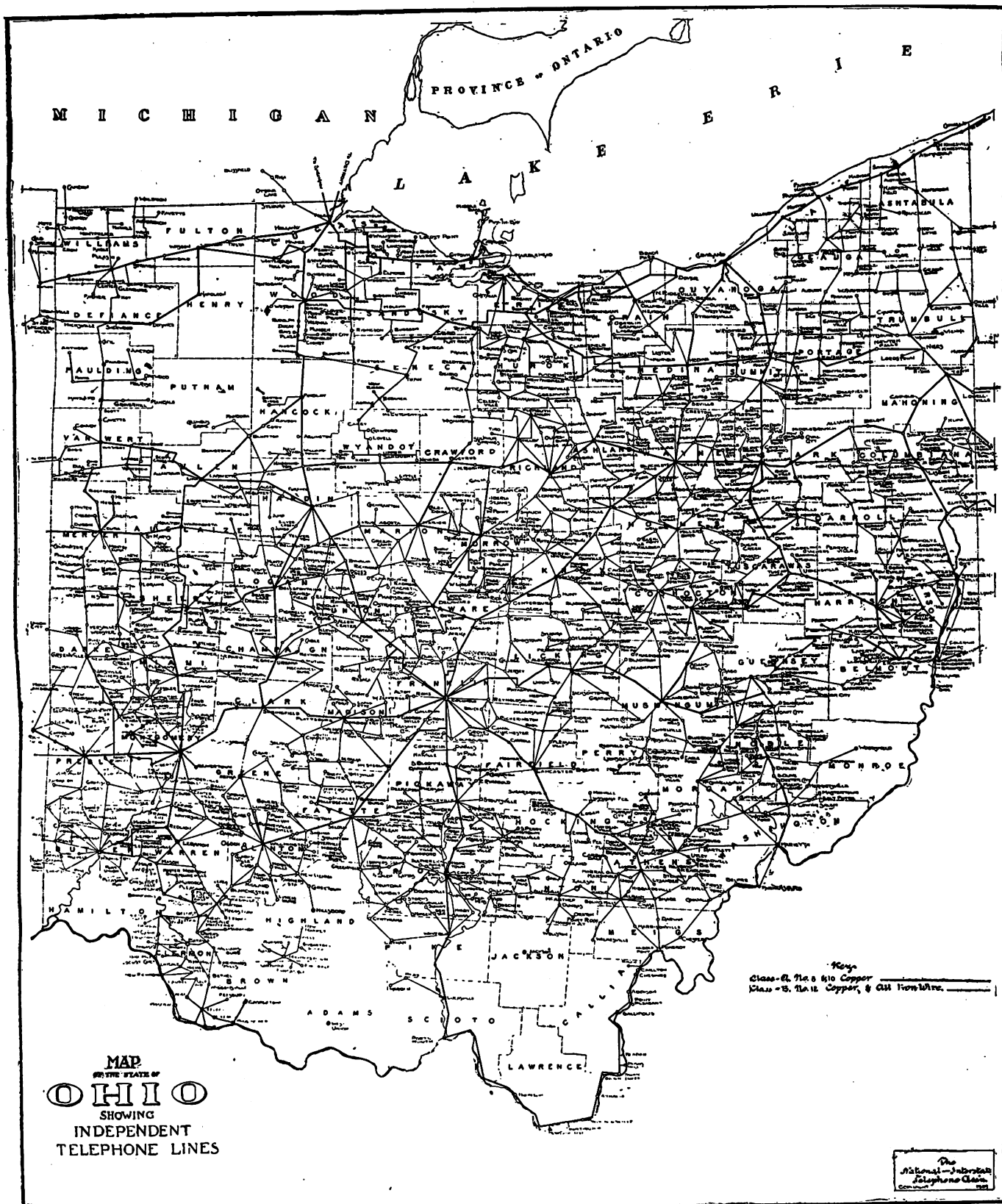
This invention relates to intercommunicating telephones in which telephonic communication may be had between a plurality of stations without the intervention of a telephone-exchange or central office.

This invention has for its objects simplicity of construction and operation, certainty and reliability of operation, and the provision of improved means for establishing secret communication between two stations of a plurality of stations with which intercommunication may be had.



It consists of a plurality of telephone instruments located at different stations, a call-battery line and a return-line common to all of the stations, a home line for each station, a plurality of contact-making devices at each station each adapted to complete a calling-circuit to one of the other stations through one of the home lines and the call-battery line and to complete a talking-circuit to such other station through one of the home lines and the common return-line, and additional contact devices for a plurality of such stations, such additional contact devices of two stations which have been connected by the operation of one of the contact devices first mentioned controlling the connections of such stations so as to complete another talking-circuit through the home lines of both connected stations.

Mr. Charlie Reed, formerly with the Kellogg S. & S. Co., of Chicago as western coast representative, has accepted a position with Sloan & Co., electrical supply dealers, Los Angeles, Cal.



The accompanying map of Ohio is only a preliminary edition showing about 75 per cent of the toll lines actually in existence. Considerable data for lines not shown has been received since tracing was made up, and the remainder is being gathered as rapidly as possible. A later edition of this map, which will be issued in the near future for general distribution will show all of these lines. Independent companies operating toll lines in Ohio who have not already sent us a map of their lines are urged to do so immediately, in order that there may be no unnecessary delay in getting out an up-to-date edition.—*The National Interstate Telephone Association.*

## INDIANA ITEMS.

**Changes in New Long Distance Discussed—Bouquets for Brailey, Jones and Others—Development of Indiana Field.**

The people of Indiana, having witnessed the upbuilding of a splendid and efficient system of Independent telephone lines, have been somewhat stirred up during the past few days, over the changes which have taken place in the most important telephone combination in the state. The New Long Distance Telephone Company has been recognized as the backbone of the Independent telephone system. When it was reported that outside parties were negotiating for the New Long Distance and the Indianapolis Telephone Company, the fear was even expressed by some not acquainted with the personality of the buyers of the controlling interest, that these people might be connected in some way with the Bell and that this might mean a return to extortionate rates and inefficient service. Now that the transfer of these properties has been made and a lot of idle rumors have been dissipated, it is becoming generally known that the new owners are among the most ardent, able and successful Independent telephone men in the entire country and that the success already achieved will be followed by an aggressive campaign for the still further improvement of lines and equipment and the betterment of the service. As Mr. James S. Brailey, Jr., one of the new directors expressed it, a few days ago, "We contemplate many improvements. The service will be strengthened in many particulars and many extensions will be made."

Independent telephone men who know the prominence and ability of the officers of the company gladly welcome them to the Indiana field. Of the officers of the New Long Distance Telephone Company, Mr. H. C. Stifel is president. Mr. Stifel is treasurer of the Altheimer and Ralings Investment Company, one of the largest of financial institutions in St. Louis. He is a director and large stockholder in the Kinloch Long Distance Telephone Company, the great company operating the long distance telephone business of Illinois and Missouri, and is also a director in the Toledo Home Telephone Company. The vice president is Mr. C. Marquard Forster, president of the Kinloch Company. One of the directors is Mr. Breckinridge Jones, than whom in the telephone field there is no one more prominent or able. Mr. Jones is treasurer of the Kinloch, and treasurer also of the Mississippi Valley Trust Company of St. Louis, an institution of great financial strength. He is the chief moving spirit in the United States Independent Long Distance Telephone Company in the principal cities of the country and which has already begun operations by buying the Stromberg-Carlson plant at Rochester, New York, the largest manufactory of Independent equipment in the country. Mr. Jones is a gentleman of large means who has proved his business ability in a number of important enterprises. Another of the directors is Mr. James S. Brailey, Jr., president of the Toledo Home Telephone Company, one of the best and most successful plants in the country. He is also a director in the Cuyahoga Telephone Company of Cleveland, famed the country over for splendid equipment and service. Other directors are: A. F. Ramsey, banker, and president of the Home Telephone Company, of Crawfordsville; M. B. Wilson, president of the Columbia National Bank of Indianapolis, and Louis Hollweg, the well known wholesale merchant of Indianapolis.

Mr. James S. Brailey, Jr., the vice president of the Indianapolis Telephone Company, who is also a leading stockholder in the New Long Distance, is president of the Toledo Home Telephone Company, and is also largely interested in Independent companies in Cleveland, Kansas City, Utica, and other cities. Other Toledo and St. Louis telephone interests are represented.

Another gentleman extensively interested in the New Long Distance Telephone Company is Mr. A. H. Bauer, of Bauer Bros., St. Louis. Mr. Bauer is a director and extensively interested in the Toledo Home Telephone Company and in the Kansas City Home Telephone Company.

The officers of the Indianapolis Telephone Company are: H. C. Stifel, president; James S. Brailey, Jr., vice president; John H. Holliday, president of the Union Trust Company of Indianapolis, A. H. Bauer and Ben A. Altheimer, of St. Louis, are additional members of the board of directors.

The acting general manager of both companies is Mr. C. E. Stinson, a practical electrician who has been active in telephone work for several years. Mr. Stinson is the chief engineer of the Brailey interest, including the Toledo Home Telephone Company and many other companies. He has taken hold of the management of the New Long Distance and Indianapolis Telephone companies in a thoroughly business like manner and the heads of the various departments are expressing their utmost confidence that the two companies have a general manager who thoroughly knows his business and that there is not only already "something doing," but a whole lot doing that will mean far greater successes than ever yet have been achieved by Independent telephone interests in the state. The new management has begun active co-operation with the Indiana Independent Telephone Association. The president of that association, Geo. W. Beers, of Ft. Wayne, has been among the many Independent telephone men from all parts of the state who have already called and assured the new owners and the new manager of their cordial co-operation and good wishes for their success.

The contention has been made by the opposition that the Independent toll systems were segregated and that they did not act in sufficient co-operation to give the best service. With gentlemen heavily interested in the toll service of surrounding states, now so largely interested financially in the Independent system of Indiana, there will be a yet further and closer bond of union among Independent interestes. The Independent telephone men of Indiana have reason to be proud of the accession of these gentlemen to their ranks.

Considering the development in the Independent telephone business in Indiana, it is not regarded as surprising that this field has attracted the attention of wide-awake capitalists from outside the state, men of large means known to be zealously devoted to the Independent cause. The tax returns to the auditor of state are indicative of the progress made. While the Central Union (Bell) Telephone Company operating in Indiana, Ohio and Illinois filed a statement, sworn to October 10, 1904, with the auditor of state of Illinois, embodying the words "No dividends paid since 1896 and none in sight," the success of the Independent companies has disproved the correctness of the prediction made some years ago that it would be impossible for the people to rescue themselves from the trust exactions of Boston capitalists and do a successful business at moderate rates. The prediction

that the Independent systems could not be brought into a working harmony has also been disproved by the great net-work of metallic circuits of the New Long Distance Telephone Company and its allied toll lines. The prophecy was then made that long distance service would be hindered by failing to effect close co-operation with the toll systems of surrounding states. The recent accession of capitalists, who have been very successful in Independent telephony in surrounding states, will now secure a broader and more intimate union. Long distance connections for points in surrounding states are quickly and satisfactorily made.

The tax returns of 228 companies in 84 counties reporting to the auditor of Indiana for 1905, with the remaining companies estimated on the same basis, showed a total investment of \$11,605,873.00, an increase of \$3,897,242.00 over 1904. The gross earnings of 1905 were \$3,500,000.00, a gain of 77 per cent over those of 1904. Improvements to the amount of \$112,846.00 were paid out of the earnings, this amount being \$42,117.00, or 60 per cent more than in 1904. The actual gain in net earnings over those of 1904 was \$313,042.00, a gain of 116 per cent. The 368 Independent exchanges in the state are shown to be doing a good business. The total number of Independent telephones in the state at the present time is about 175,000. This enormous development has been achieved within six years. There have been fewer failures among Independent companies than in any other class of business. No company has been in the hands of a receiver.

The election returns were telephoned by the New Long Distance Telephone Company election night, November 7th, to various Independent telephone exchanges throughout the state, and by them distributed to the newspapers and the people.

### THE TRAFFIC ASSOCIATION.

R. E. MATTISON.

The Telephone Traffic Association of Nebraska has been organized on account of the inability of the various companies to get settlements on inter-change toll business.

Without a clearing house it would be next to impossible to make the majority of these settlements; for example, a call sent from Grand Island to Fairbury passes over lines owned by four different companies. The originating and terminating commissions must be deducted and the balance distributed to mileage; each company receiving credit for the number of miles of line they operate, mileage being figured air line between junction points, thus making six credits and one debit in properly accounting for one message. Then consider a month's business for distribution (including calls to and from 250 different points) and you will realize beyond a doubt that settlements can not be made without the aid of a Clearing House Association.

When the Traffic Association began its work in the office provided by the Lincoln Telephone Company, at Lincoln, just two months ago today, we had plenty of floor space and a fair idea of what we wanted to do with it. We realized that in order for the undertaking to result in a benefit to all, it must require careful thought and co-operation on the part of every one concerned. We started believing that the move,—as expressed by the words of the traffic agreement "to promote and regulate inter-change telephone service between the Independent Telephone companies of the state of Nebraska and adjoining

states,"—would be a success, because the principles involved were right.

The expense of the clearing house is to be pro-rated in accordance with the number of miles of message cleared, thus placing all companies on an absolutely equal basis. The cost of clearing for the first month will be much higher than in succeeding months on account of the cost of organizing and purchasing necessary books and supplies. An estimate drawn from the experience of other traffic associations indicates that the average cost of clearing for the first year will be about three cents per message after the initial cost has been paid.

In addition to operating the clearing house the Traffic Association is making a hard fight against the sub-licensing work of our opponent. We have succeeded in blocking them at several points, and I know of no fight for toll connections in the South Platte Country that they have won during the past three months. If we all sign the traffic agreement and stand together, we are invincible. But this can not be done without some expense. It will cost money, and you should stand ready to pay the price just as willingly as you would pay for any kind of protection. We insure our exchanges against fire and against cyclones. The fire or the cyclone may never come; but the danger from the common enemy is here. We must protect ourselves against the loss of our neighboring towns of our county seat, on the whole of our adjoining county. We must protect ourselves from being surrounded by our enemy and our exchange rendered useless. This can only be done by thorough organization, the protection of which is worth more than any protection that you can buy. A single lame Independent plant is a detriment to all. A failure in one affects us all. There is no enterprise in Nebraska composed of different units, that are from the nature of their surroundings, more independent, yet more dependent upon each other for success, than are our telephone plants.

I want to make it clear to you that the Traffic Association, with its double purpose,—to regulate traffic between the various companies and to secure better organization,—is going to be a benefit to every one of its members. Should our enemy be working for the toll connection in an adjoining town, a letter or a message to the Traffic Association will bring a representative to the scene to protect the Independent interests.

Good organization, from one point of view, means standardizing accounting systems so that any exchange may benefit by the experience and methods of another; it means standardizing of operating rules, toll signs, stationery and toll line equipment. There is not an Independent Telephone state in the Union that is not working for better organization and for standardization in every department of its work.

The various lines of development among the Independent telephone companies that I have outlined is the purpose of the Traffic Association. To bring about these results every Independent company in the state must join this association or contract for toll connections with some one who is a member of this association, for single, we can be defeated; united we can not. I trust every one of you will give this association your hearty co-operation, and secure for yourselves the protection and benefits that are within your reach.

[Read before the recent meeting of the Nebraska Independent Telephone Association held last month at Hastings, Neb.]

## TO THE READERS OF SOUND WAVES

Replies to our suggestion regarding the publication of a telephone engineering course are still coming in on every mail. They are all, with but one exception, favorable to the idea.

But there are several counties yet to be heard from. The returns are not all in by any means. We are filing the letters and cards as they come in, and upon the final count will depend our future course in the matter. Therefore, let all readers who are interested express themselves. Let this be done promptly, for the decision must be made within a short time, either for or against.

If we can be sure of receiving sufficient support to undertake the labor and expense of the course in question, it assuredly will be taken up and pushed to a successful completion. Get your pen and your postal card and tell us. Vote "Yes" or "No" on the question, "Shall SOUND WAVES publish a course on telephone engineering?"

## INTERSTATE TELEPHONE & TELEGRAPH COMPANY ENDORSED.

The following resolution was passed by the Peoria (Illinois) City Medical Association at a regular meeting of the society held at Peoria on October 5, 1905:

*Resolved*, That the members of this society agree in writing that on January 1, 1906, they will discontinue their subscription to the Central Union Telephone Company for both office and residence 'phones, and that they will use only the Inter-State Independent Telephone Company's 'phones.

Amended by omitting "on January 1, 1906," and inserting, "as soon as the Inter-State Independent Telephone Company can show that they have 2,000 residence 'phones in this city." Carried unanimously.

## Telephone as a Protection From Cyclone.

A great deal has been said to convince people of the necessity of the telephone, but the latest argument comes from Minnesota. A telephone recently saved F. G. Sanders and family from death by a cyclone which passed through the county and did considerable damage. Mr. Sanders and family had just sat down to supper when the telephone bell rang. Upon answering the call, Mr. Sanders was informed that a cyclone was heading his way. The family had hardly enough time to reach a place of safety when the house was struck and utterly demolished. None of the family was injured except Mrs. Sanders, who had one arm badly crushed. Western telephone solicitors, take notice.

The Electrical World and Engineer gives the following: "An amusing scheme.—A special cable dispatch from Paris, of November 11, says: 'If Mr. Neill, a Canadian inventor, is successful in obtaining the telephone concession for which he is now negotiating with the French government, America can prepare for an invasion of 2,000 'hello' girls, who are pretty, of course. Mr. Neill, to offset the objection made against his automatic device that it would deprive 2,000 telephone girls of employment, has made a business proposal to M. Berard, director of the telephone service, to send the girls to Canada and the United States, where he would undertake to find husbands for them.'"

## Central Nebraska Toll Association.

An important meeting of the Central Nebraska Toll Association was held at the office of the Kearney Telephone Company in Kearney, Nebraska, Thursday, October 19th.

R. E. Mattison representing the Western Long Distance Telephone Company, of Lincoln, was in attendance and the Association arranged to accept the service of this company. The Western Company now has a copper metallic toll line as far as Hastings and expects to reach this city in about one month, this will give Kearney two metallic lines to Lincoln, one by the way of Grand Island and one by the way of Hastings. Out of Lincoln, metallic lines run to all parts of southeastern Nebraska, western Iowa, northern Kansas and all parts of Missouri. The large cities reached are South Omaha, Council Bluffs, Des Moines, St. Joe and Kansas City.

The Central Nebraska Association decided to join the western companies clearing house and after November the first, the clearing house feature of the Central Nebraska Association will be abandoned and all clearing will be done by the western company whose clearing house scheme embraces the entire state. The old Association still continues in existence, however, for the betterment of service and other mutual benefits.

Those present at the meeting were, Fred Ashton, H. Parmer, Grand Island; W. J. Smith, A. Allen, of Shelton; E. E. Schultz, of Kenesaw; J. E. Burge, of Holdrege, E. C. Krewson, of Elmcreek; Warren Pratt, W. S. Clapp, and W. J. Stadelman, of Kearney.

These gentlemen represented 4,134 telephones, 291 miles of metallic toll line, and 823 miles of farmer lines.

The Central Union Telephone Company has issued an appeal to the farmers in which it recites that it has 188,170 subscribers. The Central Union operates for the parent Bell company the three states of Indiana, Ohio and Illinois. It made a sworn statement for taxation purposes before the Auditor of state of Indiana that it had at the 1st of April, 1905, 146,244 telephones. It issued a statement in Ohio recently that in that state it had 110,000 telephones leaving about 36,000 telephones in Indiana and Illinois. By the last enumeration for alone 166,255 telephones. The independent system has had an enormous growth in the last few years. Practically all the farm telephones of the state are connected with the independent system.

Mr. Chas. E. Pond, of Colorado Springs, Colo., who is heavily interested in the Independent telephone development in Colorado, reports that the inducements offered investments in that state, far surpass many others in the west owing to the exorbitantly high rates charged by the Bell as they apparently are trying to make the state repay them for the losses which they are sustaining elsewhere where competition has forced on them expensive and losing conditions.

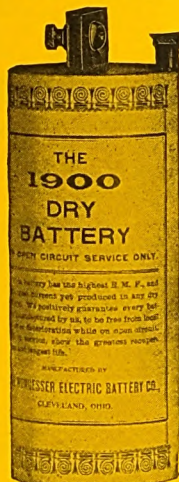
It would be well for those interested in developing properties to investigate at once.

Stromberg-Carlson Telephone Manufacturing Co., Rochester, N. Y., reports having closed contracts for switchboards for the following places: Aurora, for use at Peoria, Ill.; Newark, Ohio; Cadiz, Ky.; Bartonville, Ky.; Donnybrook, N. D.; Sherman, Tex.



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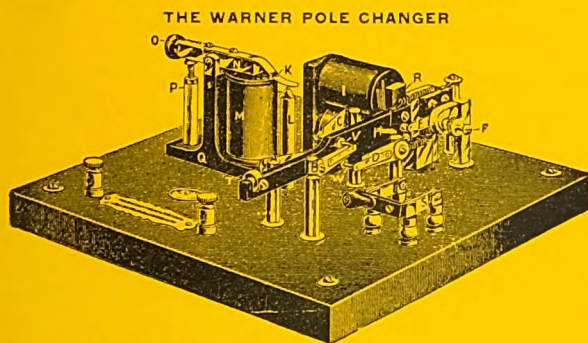
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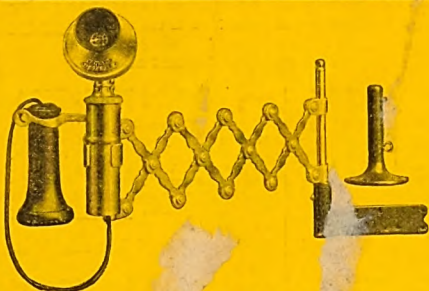
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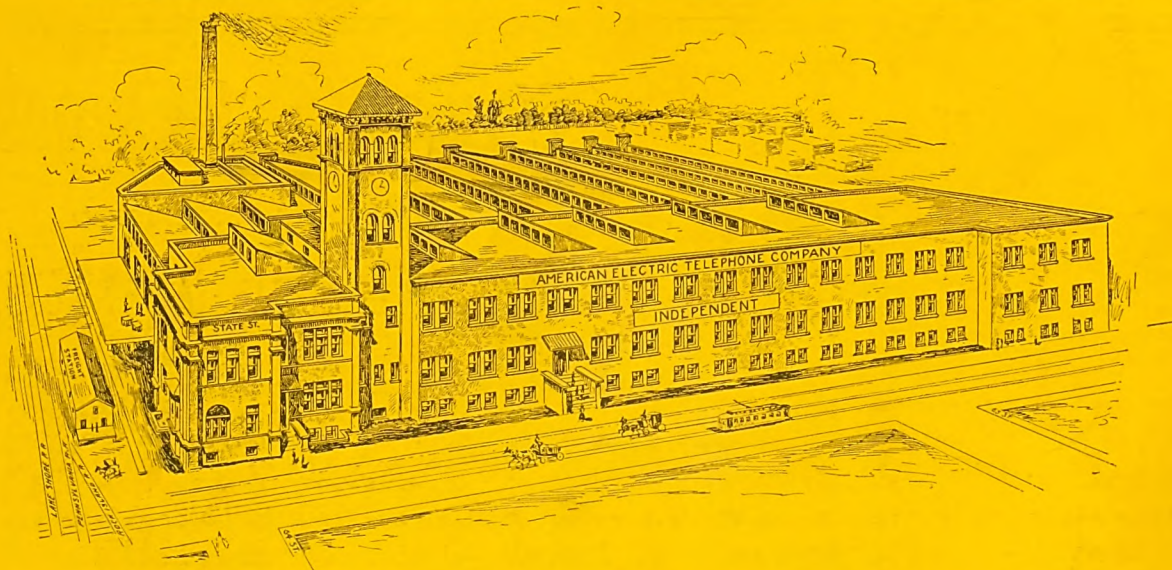
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# SOUND WAVES

VOL. XI.  
No. 2

AN ADVOCATE OF  
INDEPENDENT TELEPHONY

JANUARY  
1906

Published Monthly by THE THOMAS H. WILSON CO., Logansport, Indiana

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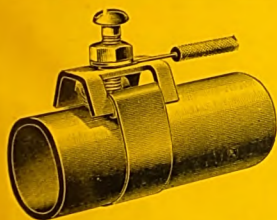


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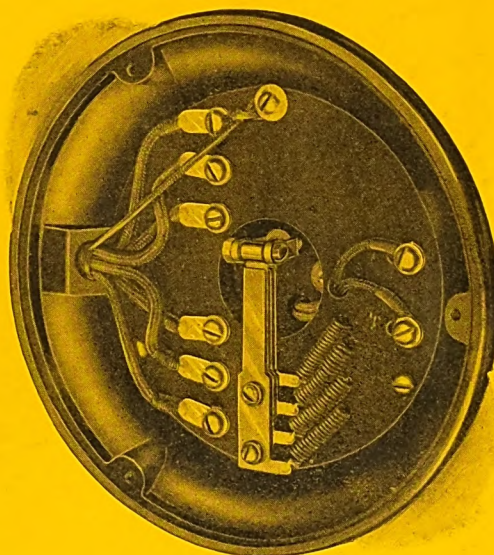




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# SOUND WAVES

A Monthly Magazine Devoted to the Interests of Independent Telephony

Vol. XI.

JANUARY, 1906

No. 2

## SOUND WAVES

PUBLISHED MONTHLY AT LOGANSPORT, IND., U. S. A. PRICE FIFTY CENTS A YEAR

Entered as second-class matter July 14, 1903, at the Post Office at Logansport, Indiana, under Act of Congress of March 3, 1879.

Wilson, Humphreys & Co., Logansport, Indiana, Proprietors and Publishers

W. A. TAYLOR, Technical Editor. . . . . 1362 Monadnock Bldg., Chicago  
MERTON J. KEYS, Legal Editor, . . . . . Box 1023, St. Louis, Mo.  
F. M. BAILEY, Manager, . . . . . 1362 Monadnock Bldg., Chicago

Telephone, Logansport Office, Black 441

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## EDITORIAL COMMENT

All communications to the editorial or advertising departments of this paper, answers to want advertisements, subscriptions, etc., should be sent to the Chicago office, addressed plainly to **SOUND WAVES, 1362 Monadnock Bldg., Chicago, Ill.** Subscribers and others will confer a favor and facilitate the work of this paper by complying with the above request. Technical and news contributions will receive prompt attention and are respectfully solicited.

## BELL COMPANY AFTER BADGER PLUMS.

The situation in Wisconsin is interesting. The Bell people are making a strong effort to capture the state, and are pursuing their usual shrewd tactics to consummate this end.

But companies assailed with the arguments of the Bell solicitors are usually sharp enough to discern the Ethiopian in the wood pile. Some, however, are caught by the specious Bell offers.

A favorite dodge is to tie up the Independent company on a toll line contract, specifying the use of Bell transmitters and receivers at a stated fixed rental from the Independent to the Bell company. This toll line contract offers a commission of 15 per cent on all tolls, but provides that not more than ten cents be paid as commission upon any one message. This 15 per cent, together with the glittering toll advantages of the Bell as presented by the plausible solicitor, looks very good indeed and the contract is duly signed up. At the end of the first month, after the bill is presented by the sub-licensee company for the toll commissions on the fifteen per cent basis, the little joker in the contract bobs up in the shape of the maximum commission of ten cents, pretty effectually knocking the bottom out of the handsome results anticipated from the contract by the sub-licensee company.

The net result usually is that the little company comes out loser on the deal to the tune of many dollars. Take, for instance, a small exchange where the rental on the Bell instruments comes to \$300 a year. The gross toll business will come to perhaps \$100 a month, and at a rough estimate, the commissions on this may amount to \$15 a month or \$180 a year. It will seldom come to a larger amount, the ten cent. maximum clause in the contract helping to keep down the total. Here we find that the sub-licensee company suffers a net loss of \$120 a year on its Bell connections alone, after paying all the fixed expenses of heat, office rent, light, salaries, maintenance, etc., to which it was committed previous to its Bell connection. In other words, the sub-licensee company must hustle to make up the loss it suffers from the Bell toll contracts out of its local subscribers. It must raise the rates or get more subscribers, and if it should happen that it had about reached the limit, where more subscribers would



necessitate raising the rates, its position would be embarrassing indeed. To raise the rates without improving the service would be to lose many subscribers, so that the advantage of increased rates would be offset by loss in subscribers. Furthermore, as soon as rates go up an opening appears for an Independent company to come in and still further cut into the business of the much worried sub-licensee company.

On the other hand, if the company in the first place had resisted the overtures of the Bell agents and had been content to work up its local business, improving its service and at the same time keeping its eyes open for suitable Independent toll connections where no instrument rentals would be demanded and the company could earn 25 per cent commission flat on all toll business without reservation, it would have found itself not only a free agent, but in a growing condition and in a position to take advantage of all the opportunities the future may hold. The way into the Bell ranks is broad and easy, but those who enter leave hope behind. But the path of the Independents, while sometimes narrow and difficult, holds all there is in telephony of hope and progress and financial reward.

### ATTACKING MUNICIPAL TELEPHONY IN GREAT BRITAIN FURTHERS BELL INTERESTS.

We note with regret that certain Independent telephone publications have attacked municipal telephony in Great Britain. While we do not propose to make any comparison between the respective merits of telephone systems as operated by Independent companies in the United States and those managed by municipalities in Great Britain, we would remind our contemporaries that there is no better way of furthering "Bell" interests than by the publication of articles designed to prove that telephone competition in Great Britain is a failure.

Our contemporaries should know that the only competitors of the telephone monopoly in Great Britain are the municipalities, and that the latter are synonymous with the Independent systems in the United States, hence any argument tending to show that the municipal systems are a failure is unworthy of those who profess to stand for telephone competition.

Were the statements published true, there might be some slight excuse for the action of our contemporaries, but even in that event we would suggest that it is not the business of an Independent telephone journal to provide weapons for the use of our common enemy. The only persons in the United States today, interested in the subject of municipal telephony, are the supporters of the "Bell" companies. Therefore we protest most emphatically against the publication of any article which can be used as an argument against telephone competition.

Independent companies in the United States have proved beyond doubt, that they can handle the telephone service with results immeasurably superior to anything which could be hoped for under municipal management on this continent. This fact, however, does not deter us from admiring those communities in Great Britain, who, debarred by law from establishing Independent companies, have used the only available means of fighting a monopoly as arrogant and greedy as the "Bell" is here.

We contend that judged by the aggregate results, municipal telephony in Great Britain has been an undoubted success. We are not concerned so much as to the character of the equipment used, though we do know it is far in advance of anything the monopoly provided before the advent of municipal telephony; nor do we care to criticise the financial methods adopted, though we are aware that these municipalities have been in the business of supplying other public utilities for many years with undoubted success, and we therefore see no reason to believe that they are not equally competent to manage the finances of a telephone undertaking. What we do know is that the people are satisfied with the service, that rates have been cut in two, and that no tangible facts are forthcoming to prove the undertakings are losing money.

Take the case of Glasgow. Before the municipal system was established, there were less than 6,000 subscribers in Glasgow and its suburbs, the rate being \$48.70 in the city and up to \$97.40 in the suburbs. The system consisted of overhead single grounded wires and "Blake" transmitters. On May 31st last, the municipal system had 8,563 direct lines at \$25.60 per annum, 42 two party lines at \$20.45, and 247 four party lines at \$15.30, that being the lowest rate charged by the municipality. The plant is full metallic and almost entirely underground, while the telephones are of the standard long distance type used in Great Britain. While the switching arrangements do not reach the standard of efficiency attained in the United States, they are far in advance of anything provided by the monopoly before the advent of central energy systems, and it is fair to say that when the Glasgow Municipal Exchange was designed there was no central energy plant in operation in Great Britain. Indeed, when Herbert Louis Webb appeared before the Glasgow Telephone inquiry as an expert witness for the National Telephone Company in 1897, he failed to mention the existence of such a system or the desirability of adopting it, neither had he anything to say against the call wire system which he now so much condemns, this possibly because the National were using it at the time.

It is also a fact that the increase in the National Telephone Company's subscribers is made up of party line stations mostly composed of 20 party lines at \$6.08 per year for 600 calls. Of direct lines on May 31st last, the "National" had 8,382 direct lines or 181 less than the municipality, while on party lines the monopoly had 6,641 telephones. The National Telephone Company has been operating in Glasgow 25 years and the Municipality four years.

The result of municipal competition in telephones in Great Britain has been to extend and cheapen the service in every case, and while we contend that genuine competition by Independent companies would have developed the service and conferred greater benefits to the people over a much larger area, as it has done in the United States, we appreciate the good work done by the municipalities and we do not propose to lend our columns for the publication of garbled versions of the alleged failure of municipal telephony in Great Britain, emanating from "Bell" sources and prepared for no other purpose than to discredit competition in telephones, whether municipal or Independent.

There is now a good long distance telephone service between Kearney and Holdrege, Neb.



### SITUATION IN MISSOURI.

The Independent telephone propaganda is being pushed in Missouri with as much energy as in any state in the Union. James F. Barnett, the traveling secretary and district organizer, writes us from his home office at Rutledge, Mo., that he has but recently returned from ten weeks' steady work in the field, during which time he has covered nearly all the state, having held eight district meetings. One more district meeting yet remains to be held, after which preparations will go forward for a state meeting, at which it is expected to have the largest gathering of telephone men ever assembled in the state.

Mr. Barnett says that the telephone business is very active all over the state of Missouri; new and larger boards are being installed and extensions made on every hand. "It will be only a short time," writes Mr. Barnett, "until we have copper toll lines covering the entire state. I am not in the least afraid but that we can meet our old enemy, the Bell, and make it a very warm time for them, regardless of the millions they have burned in a futile effort to stop the Independent movement. They could just about as easily turn the Atlantic Ocean as to stop the Independent telephone movement in the United States."

"I can see that the United States Long Distance Company will strengthen us very much and I am anxious to see them get into the field and in close touch with the Missouri Independent exchange owners.

"I meet a good many of the Kansas boys along the line, and find them wide-awake, pushing fellows. They gave me a warm welcome and I made it so interesting for them that several came over and took out membership in the Missouri organization."

The Independents have been having a warm time recently in the northern part of Missouri. The Bell company started out to buy every Independent who would sell, but thus far have secured only Carrollton at \$90,000; Kirksville, \$25,000; and Lancaster, \$6,000. Memphis was offered \$12,000, but, according to latest reports has not closed the deal. The Independents, however, have not been idle, and believe they now have the Bell people muzzled for a while, at any rate.

Mr. Barnett speaks in enthusiastic terms of the interest displayed in organization work in Missouri and the active help and co-operation he has received from Independent telephone men one and all.

### FARMERS' LINES vs. REGULAR EXCHANGES.

BY "WISCONSIN."

Having seen so many articles written on the relation of the farmers' mutual telephone lines to that of the exchange owner, one is almost ashamed to undertake to write upon this subject, and feels as though he was not going to give anybody any information or help in this direction. As far as the success of the farmers' mutual lines is concerned, time only will tell whether they are a success or not. We can not blame the farmer for trying to get his service as cheap as possible. There is one thing to consider about being a subscriber on the farmers' mutual lines, and that is, the amount of territory that we get. The time has come when no farmer is satisfied to be confined to one little territory. Another thing to consider is that the farmer is not up in the telephone business; besides it takes an immense amount of his time, and some capital to build a line of this nature; and at the

same time they have never been known to build one with a full metallic circuit and put up in any first-class way. A grounded line does very well where there are no lines paralleling it; but the time has come when it is impossible for one to have such lines, for there are so many other lines running in the same direction, that there is an immense amount of "cross talk." The mistake is made too often by the farmer in buying telephones of different resistance, of different makes, and expecting to get good service when they are all put in on one line.

It seems to me that the best thing that farmers can do, where they can get someone in the business to build them a first-class line, and charge a reasonable rate, according to the amount of territory they get, is to have this done, rather than to be dabbling in the telephone business. The exchange builders now in the greater part of the United States have outlets with long distance lines by which they are able to reach all the surrounding country from fifty to one hundred miles, which we find is the limit of most of the messages sent from the neighborhood, and are able to take care of the farmer's message over these lines at a reasonable cost. On the other hand, we find what is "everybody's business is nobody's business," and that there is not one of the subscribers who has time to look after these lines. They will find that one or two days lost from the farm at the proper time will more than pay the cost of the rental of the telephone, to say nothing of the worry and turmoil that occurs in this kind of an arrangement. A great many farmers throughout other states that we might name are giving up the idea of building their own telephone lines. Take Illinois for an example; there are ten different companies within that many counties who have given up the idea of trying to get something for nothing, have disposed of their lines to telephone managers, who have rebuilt them, put them in proper shape and are giving service from \$15 to \$20 a year, according to the territory that they wish to use.

The farmers' exchange manager up north is up against the same thing that many other farmers are in the way of spending lots of time with no compensation. Of course we find men who are willing to do this just in order to revenge their feelings, and who will find in the long run "that it is more pleasure to seek an object than to possess it." If the subscriber will only think that it takes twenty-four years of his rental at \$12 a year to pay an operator one year, it seems to me that he would not think that \$12 a year for telephone service is too much. As a matter of course, there are a number of farmers who have started in this business and do not feel as though they want to lay down and let someone else go ahead and take their lines and handle them from a business standpoint. Many farmers have said "I would rather pay my \$15 or \$20 rate and not be bothered with it, or have the responsibility resting on me to keep my part of the lines up, and pay my assessment, of whose coming and amount I do not know until I am taxed, and be entirely free from responsibility."

We recall to mind an article in the North Western Agriculturist, where a man owned a cow that made him \$50 a year. Look at it in this light; it would seem that if a farmer could keep one good cow, she would not only pay for her feed but would make enough profit in one year to pay for his telephone service, and she undoubtedly would not give the farmer as much worry as his interest would involve in a business where every subscriber has a say as to how this business must be run.

Our advice to the telephone manager of exchanges is

to equip his lines with the very best material, and construct them in the very best manner, and to give service at a reasonable rate, and branch out and take in the farmers at a reasonable rate, and where it is possible, to purchase the farmers' interest in their lines do so, and connect them all in one great system and handle them so that there may be a profit to all interested.

#### Important Telephone Pool.

The old voting pool which controlled the stock of the Toledo Home Telephone Company has been dissolved and a new one formed. Members of this voting pool are: James S. Brailey, Jr., Jay K. Secor, Clarence Brown, M. V. Barbour, T. H. Tracy, W. F. Robison, D. C. Shaw, A. H. Bauer, H. C. Stifel and T. H. Walbridge. The object of the renewal of the pool is to keep the stock as much as possible from being picked up by outside rival concerns. The pool now controls 8,000 shares and on the announcement of its formation the stock advanced to 75 or five points above the last reported sale. The bonds are firm at 93, thus aggregating for the combined bonds and stock which originally sold at 87, a total of 168; in other words the people who invested doubled their money, the interest from the bonds being more than sufficient to carry the entire investment.

The Indianapolis telephone deal promises to be even a better one than the Toledo and has brilliant prospects. The purchasers of the Indianapolis telephone property have also formed a pool and control a majority of the stock. Toledo is represented in this pool by James S. Brailey, Jr., and J. J. Robinson, the trustees being the Mississippi Valley Trust Company, the Ohio Savings Bank and Trust Company, and the Indianapolis Trust Company, thus rendering it easy for the transfer of the stocks in the three cities most interested. The other members of the voting pool are Breckenridge Jones, W. F. Nolker, H. C. Stifel, Benjamin Altheimer, A. H. Bauer, Henry Koehler.—Cleveland Commercial-Bulletin.

#### Association Bulletins.

At a meeting of the Executive Council of the National Interstate Telephone Association held at Cleveland on Nov. 24, the following resolutions were unanimously adopted:

Whereas, The president of this association has arranged for bulletins to be prepared each month for the purpose of keeping the Independent interests of the country in touch with the work being done by the organization, and calling their attention to any matters deemed necessary, and

Whereas, Arrangements have been made with the Independent telephone journals of the country for the publication of these bulletins. Now, therefore, be it

*Resolved*, That the action of the president in this matter be and the same is hereby approved, and that he be and hereby is authorized to continue such bulletins; and be it further

*Resolved*, That a vote of thanks be, and the same is hereby extended to the telephone journals for their courtesy in publishing these bulletins and rendering the association other assistance, and be it also

*Resolved*, That the secretary be and hereby is instructed to send a copy of this resolution to the telephone journals aforesaid.

The hearing before the supreme court of Milo G. Kellogg's suit for the recovery of control of the Kellogg Switchboard & Supply Co. is set for February. The high standing of the attorneys employed in Mr. Kellogg's behalf gives some considerable confidence in a favorable decision.

#### JAMES F. BARNETT.

There is no more active nor more successful missionary in the Independent telephone field than the gentleman whose likeness adorns this brief biographical sketch.

Mr. Barnett, who is the traveling secretary of the Missouri Independent Telephone Association, was born on a farm in Scotland county, Mo., where his parents moved from Kentucky. He is thirty-seven years of age. He learned the art of telegraphy at the age of fifteen and was appointed to a station on the Wabash Railroad. Finding that he did not care for the work, he resigned and went to St. Louis, where he secured employment with Christian Piper, the millionaire tobacco man, as a solicitor for consignments of leaf tobacco to the St. Louis market. Before he was nineteen years of age, Mr. Barnett had worked up an immense tobacco business for the St. Louis market from Ohio, Indiana and Kentucky.

After eighteen months, Mr. Barnett resigned to take a position with B. Nugent & Bro., the great dry-goods



JAMES F. BARNETT

merchants of St. Louis. Here he remained two years, mastering the details of the retail business, then he went with the I. Meek Estate of Bonaparte, Iowa, as a specialty salesman. After three successful years as a traveling salesman, covering five states, Mr. Barnett resigned and went into business for himself, buying and selling new inventions in the novelty line. In this occupation he has covered nearly every state in the Union. It was while he was in this occupation that he was the means of starting the great shears and scissors plant at Macon, Mo., now owned by Col. Bleeze, the millionaire, and through this enterprise finally came in touch with the lines that brought him into the telephone business and eventually on the road for the Missouri Independent Telephone Association.

In Mr. Barnett's experience he has learned the great lesson of determination and stick-to-it-iveness. Among the prime elements of success he believes to be to "keep pushing and always be true to your friends." He has, indeed, a host of friends throughout the country who will be glad to learn of his success in the Independent telephone work in Missouri, due to his experience in handling men, his energy, affability and good faith under any and all circumstances.

**Subscribe for SOUND WAVES.**

# FACTS CONCERNING ILLINOIS TELEPHONES.

Table showing Independent Telephony in Illinois by Counties, Air Line Mileage—Copper—Iron and Grounded—No. of Towns reached.  
Population of County, No. of Independent and No. of Bell Subscribers.

COUNTY	NO. TOWNS	AIR LINE MILEAGE				POP.	TOWNS REP.	IND. SUB.	BELL SUB.
		COP.	IRON	GR'D.	TOTAL				
Adams.....	12	..	17	40	57	67,059	..	....	....
Alexander.....	1	..	16	..	16	19,384	..	....	....
Bond.....	2	7	..	..	7	16,078	..	....	....
Boone.....	8	28	27	..	55	15,791	2	1085	580
Brown.....	5	..	12	33	45	11,557	..	....	....
Bureau.....	23	40	176	43	259	41,112	12	3969	27
Calhoun.....	8	..	40	60	100	8,917	1	350	....
Carroll.....	11	..	106	16	122	18,963	10	2273	140
Cass.....	6	..	7	40	47	17,222	2	109	5
Champaign.....	23	..	104	..	104	47,822	21	3068	900
Christian.....	16	..	74	75	149	32,790	7	1830	910
Clark.....	1	..	2	..	2	24,033	1	200	....
Clay.....	5	..	..	27	27	19,553	1	58	....
Clinton.....	..	..	..	..	..	..	..	..	..
Coles.....	15	..	71	51	122	34,146	9	1701	225
Cook.....	7	..	23	..	23	..	1	160	1
Crawford.....	13	..	25	67	92	..	..	..	..
Cumberland.....	7	9	..	47	56	16,124	3	501	2
DeKalb.....	20	73	145	30	248	31,756	15	2680	677
DeWitt.....	12	34	100	..	134	18,972	8	1059	....
Douglas.....	5	..	22	..	22	19,097	..	..	..
DuPage.....	2	..	26	..	26	28,196	1	512	230
Edgar.....	4	..	11	6	17	28,273	2	325	....
Edwards.....	..	..	..	..	..	..	..	..	..
Efingham.....	12	..	22	69	91	20,465	7	571	590
Fayette.....	10	22	63	..	85	28,065	..	..	..
Ford.....	5	..	9	3	12	18,359	4	804	..
Franklin.....	..	..	..	..	..	..	..	..	..
Fulton.....	26	..	57	134	191	46,201	17	3436	1156
Gallatin.....	..	..	..	..	..	..	..	..	..
Greene.....	9	34	38	37	109	23,402	6	1351	101
Grundy.....	3	42	3	..	45	24,136	..	..	..
Hamilton.....	..	..	..	..	..	..	..	..	..
Hancock.....	16	..	32	104	136	32,215	5	1375	....
Hardin.....	..	..	..	..	..	..	..	..	..
Henderson.....	5	..	24	40	64	10,836	2	400	2
Henry.....	13	..	26	103	129	40,049	9	4395	53
Iroquois.....	9	..	46	6	52	38,014	1	1	100
Jackson.....	2	..	..	12	12	33,871	..	..	..
Jasper.....	5	..	..	19	19	20,160	..	..	..
Jersey.....	2	8	9	6	23	14,612	..	..	..
Jefferson.....	..	..	..	..	..	..	..	..	..
JoDavies.....	9	..	76	..	76	24,533	9	822	243
Johnson.....	1	..	8	..	8	15,667	..	..	..
Kane.....	25	138	130	4	272	78,792	15	4477	4289
Kankakee.....	19	13	115	..	128	37,154	8	1504	1282
Kendall.....	11	23	83	..	106	11,467	11	653	674
Knox.....	12	..	47	33	80	43,612	9	4164	906
Lake.....	..	..	..	..	..	..	..	..	..
LaSalle.....	27	39	192	20	251	87,776	21	3831	1726
Lawrence.....	1	..	3	..	3	16,523	..	..	..
Lee.....	16	105	83	43	231	29,894	11	2286	236
Livingston.....	17	105	33	77	215	42,035	9	1850	..
Logan.....	17	..	128	17	145	28,680	13	2620	19
McDonough.....	7	..	53	73	126	28,412	..	..	..
McHenry.....	2	..	6	..	6	29,759	2	50	125
McLean.....	35	75	210	..	285	67,843	29	5376	1463
Macon.....	16	50	110	..	160	44,033	7	3110	1909
Macoupin.....	17	18	39	63	120	42,256	9	1451	448
Madison.....	..	..	..	..	..	..	..	..	..
Marion.....	1	..	7	..	7	30,446	..	..	..
Marshall.....	9	16	38	63	117	16,370	5	660	29
Mason.....	9	..	48	12	60	17,491	7	1777	222
Massac.....	..	..	..	..	..	..	..	..	..
Menard.....	7	..	32	28	60	14,336	3	228	123
Mercer.....	12	..	9	74	83	20,945	..	..	..
Monroe.....	..	..	..	..	..	..	..	..	..
Montgomery.....	12	..	..	59	59	30,886	..	..	..
Morgan.....	19	33	144	26	203	35,006	7	2285	1554
Moultrie.....	4	..	11	8	19	15,224	4	1027	..
Ogle.....	22	18	127	6	151	29,129	12	2322	356
Peoria.....	11	..	28	39	67	88,608	6	2710	7125
Perry.....	1	..	..	6	6	19,830	1	180	..
Piatt.....	3	..	29	..	29	17,706	1	200	..
Pike.....	25	62	108	39	209	31,595	25	1200	..
Pope.....	..	..	..	..	..	..	..	..	..
Pulaski.....	10	..	43	..	43	14,564	3	850	405
Putnam.....	5	8	27	23	58	4,746	2	327	3
Randolph.....	13	..	28	57	85	28,001	..	..	..
Richland.....	1	..	..	5	5	16,391	..	..	..
Rock Island.....	10	6	23	8	37	55,249	1	110	1
Saline.....	..	..	..	..	..	..	..	..	..
Sangamon.....	33	83	186	30	299	71,593	9	3276	3457
Schuyler.....	4	..	11	52	63	16,129	..	..	..
Scott.....	6	17	43	..	60	10,455	1	235	..
Shelby.....	15	..	19	62	81	32,126	6	1700	1
St. Clair.....	1	..	4	..	4	86,685	1	175	1
Stark.....	10	..	27	40	97	10,186	9	1521	1
Stephenson.....	15	..	118	..	118	34,933	11	2725	845
Tazewell.....	13	35	118	12	165	33,221	13	2972	643
Union.....	..	..	..	..	..	..	..	..	..
Vermillion.....	..	..	..	..	..	..	..	..	..
Webb.....	..	..	..	..	..	..	..	..	..
Webb.....	10	..	62	47	109	23,163	9	2625	600
Warren.....	1	..	..	..	..	19,526	1	30	..
Washington.....	..	..	..	..	..	..	..	..	..
Wayne.....	9	..	..	59	59	25,386	..	..	..
White.....	24	45	133	18	196	34,710	11	2871	1258
Whiteside.....	18	110	168	6	284	74,764	11	5105	2539
Will.....	..	..	..	..	..	..	..	..	..
Williamson.....	4	29	16	..	45	47,845	1	2300	1700
Winnebago.....	..	..	..	..	..	..	..	..	..
Woodford.....	13	15	35	73	123	21,822	11	2632	1

TOTAL	903	1335	4284	2257	7876	2,524,472	471	106,932	39857
Independent									
Bell									
Independent Majority									
	106,932								
	39,857								
	67,075								
Independent Toll line in 81 Counties									
Population of same Counties, 2,036,718									
Showing one Independent phone to every 19 inhabitants									
" " Bell " " 51									
" " Phone " " 14									
Independent phones to Bell 2-2-3 to 1.									

## RELATIVE INDEPENDENT AND BELL SUBSCRIBERS IN PRINCIPAL CITIES OF ILLINOIS

	Ind. Sub.	Bell Sub.		Ind. Sub.	Bell Sub.
Peoria .....	1,500	6,000	Dixon .....	875	225
Springfield .....	2,400	3,300	Sterling .....	900	800
Rockford .....	2,200	1,700	Urbana, Champaign .....	1,500	750
Joliet .....	1,900	2,016	Clinton .....	800	3
Aurora .....	1,850	1,700	Princeton .....	800	6
Bloomington .....	1,500	1,000	Sycamore .....	500	10
Decatur .....	1,200	1,300	Savanna .....	650	75
Jacksonville .....	1,475	500	Sandwich .....	460	1
Galesburg .....	2,400	900	Rochelle .....	500	10
Streator .....	1,300	300	El Paso .....	680	
Freeport .....	1,500	525	Decatur .....	1,200	1,300

## OPERATION OF SMALL EXCHANGES.

This has been one of the most difficult problems for telephone managers to solve for many reasons; first, they cannot give the exchange their personal attention, second, the profits are not large enough to justify an experienced man; third, the operator has had no training and usually a young lady that has not been in public service before, therefore does not know how to handle the public.

Now take for example an exchange in a small town, say of 500 inhabitants, properly constructed with the central office equipment installed in a first class manner with say 20 business telephones at \$2 per month, and 60 residence telephones at \$1 per month, making the revenue \$100 per month. First there is the office rent which at least will be \$5 per month; office expenses on an average of \$3 per month; central office maintenance, such as batteries, cords, etc., \$2 per month, making the total expense of central office \$10 per month.

Maintenance of line, telephone and outside construction on an average of 20c per telephone will be \$16 per month, bringing the expense up to \$26 per month without any labor.

For operating, at least two persons must be figured on besides a lineman. These operators can not be secured for less than \$15 per month and lineman at least \$50, this bringing the expense up to \$106. Now if the owner of the plant does the line work he is not even making good wages, besides not paying interest on the investment.

The only manner in which I have ever been able to solve this is for an operating company to be organized to do building and operating of small exchanges and do it in this manner.

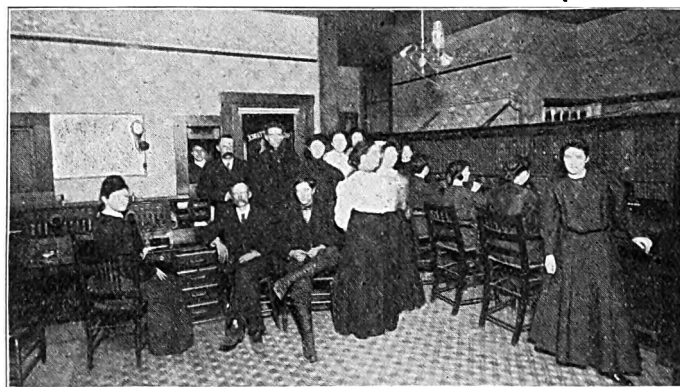
Have the exchange well built and the central office equipment properly installed.

Let a young lady be trained for several months at operating and repair work in shop, then take her at the beginning where the exchange is being built and have her draw the diagrams of the cable pole, terminals, and switchboard; by doing this she will have a good knowledge of the exchange proper and her experience in the shop will enable her to do most of the repair work on the telephones and to keep both terminals in repair; this done and very little trouble will exist and what there is she can patch up in some manner and keep the 'phones working until there is some construction work to do, at which time she will have to secure the services of a lineman and then she can have him to this repair work. She can secure some girl in the town who is willing to learn operating and will relieve her for about \$10 per month. Now she has her room furnished and by doing light house-keeping she will make good wages on from \$30 to \$40

per month. The maintenance expense will not exceed \$10 per month and extra linework will not exceed the same amount thus making the total expense not over \$70 per month, leaving \$30 or more per month to pay interest and a dividend.

## A Solid Concern.

The accompanying illustration presents a view of the office and force of the National Telephone & Electric Co. at Clinton, Ill. B. F. Wasson is president of this company, owning one-half of its stock, which sells above



par. The company now has 4,000 miles of wire and 2,500 'phones, with orders for over 200 more. Three construction gangs are busy trying to get the work out of the way for the winter.

Muncie, Chicago and Marion capitalists, represented by O. L. Barger, have been granted a franchise by the Board of Public Works of Marion, Ind., to place an automatic telephone system in that city. The rates to be charged are \$1.50 a month for residence and \$2.50 for business houses, no charges to be made for use of any telephone until 1,000 have been placed. A tax of 66 2-3 cents for each telephone will be paid annually into the city treasury. Construction of the plant is to begin in four months, to be completed in eighteen.

The Home Telephone Company has an ordinance before the council at Nashville, Tenn. It is reported that the Cumberland (Bell) Company, has made a proposition to the telephone committee of the council contingent upon the defeat of the proposed Home franchise. The report, which bears the merit of being plausible, can not be verified from the chairman of the committee, who declines to give information. Considerable feeling has been stirred up over the matter.



# Cross Talk on Telephone Lines

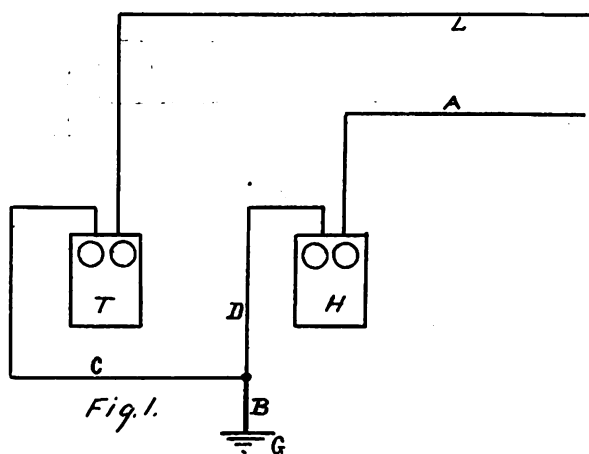
W. A. TAYLOR

The most aggravating cases of trouble that occur on telephone lines are those due to cross talk. This may come from several causes:

- 1st, Conduction.
- 2d, Electro-magnetic Induction.
- 3d, Electro static Induction.

By far the most of the cases of trouble come from the first cause. Poor insulation is responsible for the cross talk by conduction. If there are trees touching the wires of a line, there will be cross talk just the same as though there were a direct connection between the lines involved. To be sure there is more or less resistance between the two lines involved, but the circuit is made through the limbs of the trees just the same. One limb may not cause the trouble but if there are a great many touching the wires, there must be a pretty fair connection.

It is not often very apparent why and where the difficulty exists, for all trouble from this source is not always in plain sight. It is easy enough to see a piece of wire on the line or a limb from a tree which touches two wires but a cross from a poor ground or a high resistance in a return wire is not so easily located.



Perhaps the most familiar cause of cross talk on grounded lines comes from a poor ground connection for two or more lines.

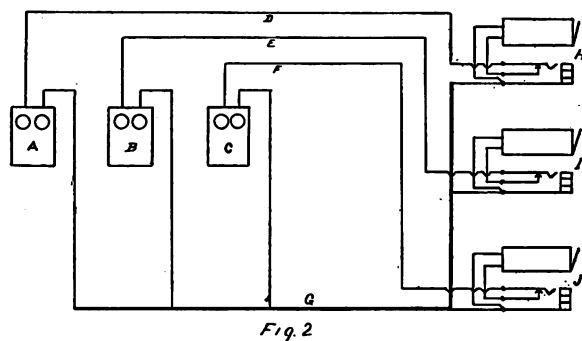
This is illustrated in figure 1, L and A represent two grounded lines, connecting with two telephones, T and H. The two lines are grounded at a common point G. If the earth connection is high in resistance, either because of some poor joint or poor earth contact, there will be cross talk between the two telephones. When telephone T is used the talking circuit is through the line L, conductor C, and ground G, if the ground is good. Suppose that there is a high resistance in the ground connection, then the circuit passes through the line L, telephone T, wire C, wire D, telephone H, line A. The two lines are thus crossed by conduction. The higher the resistance of the ground, the stronger will be the cross talk.

Great care must therefore be used in making a ground which must serve for more than one line. The ground rod or plate should be deep and in ground that never gets dry and which never freezes. The ground plate is better than a rod in such cases for there is more surface

exposed and therefore it is easier to have a low resistance. Sand or gravel make very poor grounds and when such is encountered, extra care must be taken to have a large surface exposed to the contact of the soil. Metal well tubes, or underground iron or lead pipes are good for making connections. All connections to ground rods or plates must be carefully soldered.

Very similar to the cross talk due to poor grounds is that caused by common return wires in exchanges. The common return was adopted, partly because of the trouble in getting good grounds, but more particularly because of the introduction of the electric light. When the electric arc light was first introduced, there was not so much pains taken as to insulation, and consequently the telephone lines suffered. Later on came the grounded circuit trolley lines which made the grounded telephone an impossibility. By returning all the telephone lines on one common wire a substitute for the ground was obtained and the lines were better insulated from the foreign currents.

Figure 2, shows how such a common return is arranged. Three telephones A, B, and C, are shown connected with the lines D, E, F, and the common return G.



Three drops and jacks H, I, J, are shown connected with the lines. As long as the resistance of the return wire is kept very low there will be no cross talk; but just as soon as there is any material resistance, there will be trouble. As the circuit stands, with a return that is proper in resistance, either telephone may be used without the conversation being heard at either of the other two instruments. Suppose that there is a bad joint in the return wire at the point G, and the telephone A is in use; the talking current will pass to the common return to the point G where but part of it will be allowed to pass, the rest will divide and go through the two telephones B, and C, and from there to the drops I, and J, then to the common return and thence back to the telephone A, completing the circuit. Anybody listening at the telephones B, and C, can then hear every thing that is said at telephone A. If the common return wire should be too small, exactly the same cross talk will be noticed. The higher the resistance of the return, the greater will be the trouble from the cross. Really the only return that will show no cross talk, is one of no resistance. As there is no conductor of no resistance, it follows that there is always more or less cross talk on a common return system. The trouble may be reduced to such a degree that any cross

talk may not be understood by those who happen to be listening. As copper is a material of very low resistance, it follows that it is the best material for the return wire. Should the return wire be wholly open at the point G, the bells and drops on all three lines would be operated if either telephone should signal. If there should be fifty or more telephones on this return, a ring of the bell of one of them, would not ring the other bells or drops because the generator would not give sufficient current, but there would be a great deal of cross talk noticed.

It will be noticed that the common return is common to all the jacks as well as to all the telephones. There should be just as much care taken to have good connections in this common wire or common tie, as it is often called, as in the wire out on the line, for just as much trouble can result from an open circuit in it.

There is frequent cross talk in the switchboard that seems difficult to locate. This is caused by the winding of drops being grounded upon the cores. The cores of the drops may all be connected together by a metal framework. Such cross talk may be explained by figure 3. Suppose the winding of each drop is grounded upon its core at J, and K; then if telephone I be used, the circuit will be obtained through line E, jack B, drop A, and then back to the telephone by way of the return G. Another path is also passed through. When the current passes to the point J, of drop A, part of it goes to the core and from there to drop C, by way of the metal frame. It then passes through the winding of drop C to the return

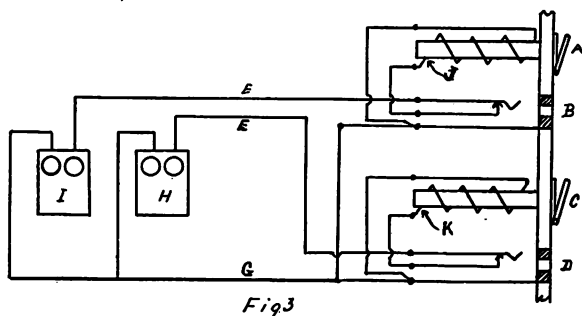


Fig 3

and also over the line E and through the telephone H. Thus both drops are thrown and both telephone bells rung. If it should happen that both parties had their receivers off, pretty fair conversation might be carried on. The cross talk is immediately removed as soon as the plug is inserted into either jack.

Quite frequently bad cross talk is caused by grounded clearing out drops. Such drops, being in the circuit all the time, will cause bad cross talk unless the windings are well insulated from the cores.

Under no circumstances should the wiring of a switchboard be soldered with anything in the shape of an acid or paste flux. Pure rosin is the best flux and so far the only one that is of any use. Acid will spread and is of itself a conductor. It will corrode the insulation and also draw moisture. Paste solder is not quite so bad as acid but there is not much difference.

Any electromagnetic apparatus that is in the circuit all the time must have an iron shell over it or there will be electromagnetic induction in the adjacent apparatus of similar kind in other circuits. Of late years all drops in switchboards are made tubular when they are in the circuit when talking takes place. There are still a few old boards in existence that have the unshielded drops which are not cut off when the connection is made. It is

found that in these boards, a conversation taking place on one line may be heard on an adjacent line whose drop is next to that of the busy line. When the drop is covered with a heavy iron shell or tube the lines of magnetic force are all retained, but when there is no cover, these lines spread and enter the cores of adjacent drops. The variation of these lines of magnetic force in the cores of the drops induces a current in the windings exactly similar to that of the talking current on the busy line. This induced current of course passes out over the other lines and anybody may hear the conversation. The clearing out drop is of course always in the talking circuit on any board and must be of tubular design.

If more than one repeating coil is used in a switchboard, they should be tubular or should be widely separated. The type of repeating coil with the iron wire core bent back over the outside of the coil is ordinarily used in boards. Under proper conditions such coils may be made to cross talk fully four feet. If this same coil be placed in a tube of iron, there will be no cross talk whatever, provided that the walls of the tube are heavy enough. If the repeating coils in the board cause cross talk and it is not convenient to separate them a great distance, the trouble will be helped by arranging them as shown in figure 4. The coils A, C, and E, are placed at right angles to coils B, and D, so that the stray lines of force will not pass through the cores of those coils. The fact that B, and D, are between the other three prevents

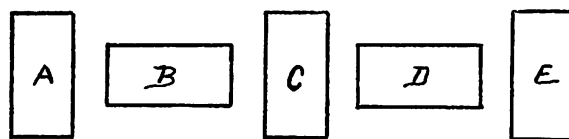


Fig. 4

the cross talk to some degree between A, C, and E, as the lines of force are short-circuited through the iron wire surrounding them. When the coils are placed parallel to each other, the stray field from one can very readily enter the core of the next and cause the trouble. The above arrangement will not entirely do away with the difficulty but will prevent any noticeable cross talk.

Perhaps more cross talk comes from direct leakage between the lines than any other way. This is especially true in cables. One who has not had experience with cables, cannot know how much trouble is caused by poor insulation. The wires of a cable are so close together that there will be leakage if there is half a chance. If the ends of a paper insulated cable are left open for a ure from the atmosphere to reduce the insulation resistance very materially. A carelessly made splice will be apt to cause all kinds of cross talk. The insulation may be so high in such a joint that it cannot be rung through, but still it can be talked through.

Paper cable must be sealed at both ends and kept that way or the moisture will creep in. After a cable has been left with the end open for twenty-four hours, moisture may be noticed fully six feet inside the sheathing. The insulation resistance of a good cable should not fall below 100 meg-ohms per mile. A meg-ohm is 1,000,000 ohms. It is not uncommon that a cable will test 1,500 meg-ohms per mile.

(To be Continued)

# Coils Used in Telephone Work

P. KERR HIGGINS

There are a number of different coils used in the telephone business, among which the following are probably the most important: (1) Pupin coils. (2) Repeating coils. (3) Resistance coils. (4) Retardation coils.

It would seem wise, at this time, to consider some of the terms used in connection with coils of all kinds so that when we come to consider them specifically we may know and understand the full meaning of the terms used. In connection with coils we find the following, (1) Resistance. (2) Impedance. (3) Retardation. Resistance as we understand it in connection with coils and conductors, refers only to its ohmic resistance or its conductor resistance and has no relation whatever to static or magnetic effects. We find two kinds of coils used for resistance, a "dead resistance" or non-inductive resistance, this being a resistance coil in which only the ohmic resistance to the passage of the current and consists of the usual coil but having no iron core. This is frequently used for holding lines or for use in the secondary of a party line to prevent a partial short on the line caused by "eavesdroppers" and is cut in the secondary in series with the receiver, such an arrangement (or a condenser which is better) enables central to call stations even if several telephones are off the hook. Such a coil is also used as a shunt for testing purposes, etc. We may therefore consider resistance as two fold, according to the purposes for which it is to be used. Resistance can not exist until some pressure is forced against it, this pressure we know as voltage or electro-motive force; we do not definitely know just how the force or pressure operating against resistance produces heat, but the fact remains and forms one of the fundamental elements of electricity; hence a knowledge of the rules governing such is necessary to know how to avoid this waste of energy. This knowledge enables us not only to protect ourselves against loss but to turn this very feature to good account, e. g., in the electric light, in the fuse, etc. When a current has been forced into a conductor, there is at once formed a field of magnetic force around the conductor, which can be proved by placing iron filings on a cardboard and laying a wire on them through which a current from the house supply (110 volts with lamp in series) passes and immediately the iron filings arrange themselves in concentric circles round the wire showing clearly the field of force in a similar manner to that of a magnetic body under similar conditions, with only one difference: if the bar be magnet steel then the magnetism is retained; but in the case of the conducting wire being copper, and not a magnetic retainer, loses its magnetic effect as soon as the power or current is shut off. This magnetic effect is entirely different from the heat effect of resistance, and any variation in the current makes similar variations in the extent and influence of the magnetic waves. This action is known by the name of Inductance. We thus see that the moment the current is turned into the wire, electricity commences to flow, at first being used in creating the fields of force around the wire, and if the current is uniform no other change takes place. Any variation in the current will vary the magnetic field, hence with every increase in current the magnetic field abstracts energy, delaying the increase, and when the current is decreased

the magnetic circuit returns energy, delaying the decrease. The name given for this phenomena is Retardation. Another action takes place in the conductor in the form of a counter electro-motive force, caused apparently by the reaction of the magnetic field and showing a tendency to neutralize the original pressure. A simple illustration of this is found in the receiver. In front of the magnets is an iron diaphragm; on speaking into the receiver the sound waves produce vibrations in the thin diaphragm and the diaphragm, being in the fields of force of the permanent magnets, will vary or cut these lines of force, setting up an electro-motive force in the coils fixed on the ends of the permanent magnets which, if the circuit is closed through another receiver, will show a current is flowing. The faster the variations the more frequent the pulsations, and a similar action in a generator or dynamo is termed reactance. This reactance has an important bearing on coils and depends on the magnetic field; now if the conductor is in a straight line then the field of force will be the minimum, but if the wire is wound in a coil then a larger inductive or reactive influence takes place and if the coil is surrounded by a closed magnetic shield the maximum is reached, for the reason that each turn

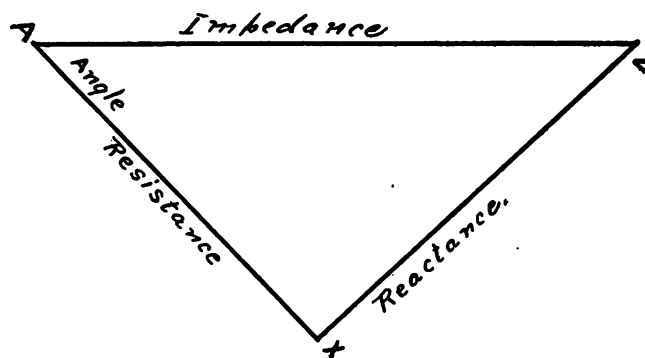


Fig. 1.—Diagrammatic View of Impedance

(ampere turn) of the coil will be cut by the greatest lines of force. This action is greatly intensified by the presence of an iron core, which tends to increase the magnetic field which, while undesirable in some instances, is very necessary in others.

In order that we may be able to determine how much this reactance is we must consider three things: (1) The shape and construction of the coil. (2) The frequency of the current used. (3) Material used for core and shield. The formula for finding the reactance is: Reactance = speed of armature  $\times$  voltage  $\times$  inductance  $\times$  permeability. The answer being in ohms. The speed of the armature would be found by multiplying the radius of the armature by the ratio between the circumference and the diameter of a circle by the revolutions per second; answer in revolutions per second. To this would be added the conductor resistance of the coil or conductor. Impedance may be defined as the true opposition to the current, and reactance is due to impedance. The effect of retardation, impedance, reactance, etc., in a current flowing is in large measure similar to resistance, in other words they decrease the flow in a somewhat similar manner. The method of determining impedance is to take a sheet

of cross section paper and make it to scale (as in Fig. 1) then draw the line A. X, which we will assume represents resistance of wire or conductor; then draw the line X Z at right angles to the angle A X; this line represents the reactance, as found by the formula previously given. Then connect the points A Z with a line and this line will be the impedance. Now if the chart has been drawn to scale and the resistance and reactance are known in ohms, and the lines drawn to scale, then the line A Z will be given in ohms and represent the impedance of the coil. These apply to alternating currents of high frequency, such as voice currents, those in common use in telephone work. This law is necessary, as the rule used and known as Ohms law does not apply in this case, the reason being that the loss in current is not due to ohmic resistance alone but to the other obstructions as explained, hence if we wish to use the Ohms law we must replace resistance with impedance and it would read  $C = \frac{E}{Z}$ . Another method of obtaining impedance is arithmetically using the following formula:

$$\text{Impedance} = \sqrt{\text{reactance}^2 + \text{resistance}^2}$$

The introduction of impedance tends to hold back the current from reaching its maximum value which it would reach in a straight piece of wire, hence the current wave is slightly behind the prime current wave and is known as the lagging current, and the calculation of the lag is the angle between any point of the electro motive force and the current wave and is found by adding together geometrically the ohmic resistance and the reactance angle Z A X or divide the reactance by the resistance, the result being the angle of the lag which can then be found by reference to a table of tangents.

It having previously been mentioned, a brief



Fig. 2.—Method of Showing Wave Motion.

explanation of wave motion may be given here. Electric energy being transmitted from place to place is termed wave motion, the theory being that the material of the conductor is set in motion and pulsates to and fro and this motion is termed wave motion and is seen in Fig. 2. The amplitude of the wave is the highest distance or motion to and fro made by the particles of the material of the conductor. Another term which is used (in polarized coils) is polarity and is explained by the theory that a conductor, carrying current, is surrounded with magnetic whirls and these always revolve in the same direction around the conductor, a compass being placed above or below the wire, its north pole will be deflected in the direction of the magnetic whirl; the pole which the current leaves (the positive pole) can then be determined. In the construction of induction coils and retardation coils, induction is a very important factor, the ohmic resistance being merely functional. In efficient transmission of voice waves the highest efficiency can only be obtained by a proper understanding and application of this inductance and not only this but the following list:—Electro-motive force. Ohmic resistance. Current. Capacity. Speed or rate of frequency per second.

#### PUPIN COILS.

The coils are named after their inventor, Dr. Pupin, and the theory of his invention has been well known to

almost every telephone engineer for several years, but remained to be developed and completed by a man who was not directly connected with the telephone business; the discovery was in reality in the method of applying the theory so as to make it practical. To Heavyside must be given the credit for having first laid down the theory. When an electrical impulse first goes out over the line, the surrounding and normal conditions are disturbed, a magnetic field is created in the ether surrounding the conducting wire, the normal conditions of the conductor are also changed by the passage of the impulse; this is termed the leading current and will rise to its maximum height when the first impulse comes on, and fall to its lowest point when the first impulse is at its height. The leading current is a counter current or pressure which tends to retard or hold back, being in the reverse direction of the first impulse. There is another current which is termed the lagging current because it remains or is held on the conductor after the circuit is broken. These currents have a tendency to flatten out an alternating or high frequency current, such as voice waves induced on the conductor. As an illustration of this effect, an induction coil might be so arranged as to have a battery connected in the primary and a telegraph relay in the secondary, the making and breaking of the primary circuit will illustrate the theory of the leading and lagging currents. These currents (induced) affect the clearness of the voice, distorting the original voice waves, hence the static or inductive effect being reduced to the minimum and the introduction of proper coils at the proper points in the conductor or line will have a tendency to neutralize this

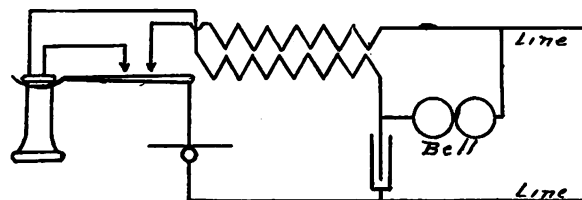


Fig. 3.

effect. These distortions are caused by what is known as self induction or capacity or both, the result being to flatten the voice wave. The more rapid the frequency the greater the capacity, hence if a definite frequency could be established the problem would be very much simplified; but with the human voice no two are alike as to the frequency (and it was here that Dr. Pupin made his success) varying from 500 to 5,000 per second. Dr. Pupin took these voice waves and studied them carefully. Analyzing their every detail he discovered that there was a wave length for every electrical impulse, caused by a variety of tones and so he added reluctance to the line at various points to overcome the static effect so as to neutralize the static effect before it had time to seriously distort the original voice wave. These coils were placed in series with the line at short intervals, and these being evenly distributed reduced the static effect on the line as a whole. He states that it is his opinion that they should be distributed one mile apart on open lines and one-eighth mile on cable lines. The coil is extremely simple, consisting of a wooden spool round which is wound a few turns of No. 2 wire; in some cases he has used the conductor wound around an iron wire core of finely annealed wires .001 inch in diameter. These coils are sometimes called Loading coils and their indiscriminate use tends to distort the voice currents; but their proper distribution within the



wave length, according to a predetermined plan, will tend to confine any distortion to that wave length and eliminate the possibility of accumulation over a long line, such losses being termed distortion loss and reflection loss. In order to avoid these losses the coils are spaced upon predetermination of the highest periodicity that may be retained in a telephone wave so as to retain it in as nearly as possible its original form, which periodicity is obtained from the velocity of the wave, being the coils passed by a wave in one second of time; the minimum being about 8,000 per second. The coil should be so constructed that the resistance to the periodicities of the waves shall be as nearly the same as possible; its essentials are inductance and the requisite ampere turns and low resistance. The wire must therefore be large, few turns with an iron core, as already explained. A test was recently made over 1000 miles to determine the proper coil, all conditions being alike. Two kinds of coils were used, one having an iron core 15.5 ohms resistance with a periodicity of 2000 per second, and an all copper coil of 11.8 ohms at 2000 per second; the result of the test was no apparent difference in character of quality of tones, showing that the reduction of the waves of highest periodicity does not materially affect the tone quality of the voice wave. Dr. Campbell, who has been an enthusiastic investigator, suggests the following as the best commercial coil; a coil having a resistance of 2.4 ohms, inductance .25 henry, a time constant of .048 second with

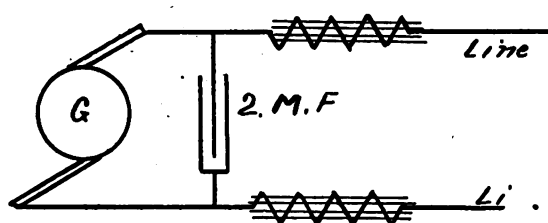


Fig. 4.

1000 periods per second, size 314 cu. inches, 10 in. in diameter, and 4 in. high, with an effective resistance of 15.5 at 2,000 periods per second. The time constant may be varied by changing its size, but this increases the cost which must be considered. Better results are obtainable on cable lines than on aerial because of the uniform insulation on the former. Self induction tends to reduce the alternation and rob the coils of their purpose, and self induction is very high on aerial lines and extremely variable. In Germany experiments were made on a cable 20 miles long between Berlin and Pottsdam. The cable was of the ordinary paper type underground, the conductors were No. 18 B & S copper wire, the resistance being 38 ohms per mile, capacity, .06 mf, inductance, .0012 henrys. The coils were 4.1 ohms, resistance and inductance .062 henrys. The coils were located 2000 feet apart in iron boxes similar to a distribution box. Fourteen pair were set apart for the test, seven with and seven without loaded coils. The result of the test was greatly in favor of the pairs equipped with coils. Five pairs were connected in series to make the line longer and was equal to the service over one length without any compensating coils. The lines were then joined in series to represent 250 miles of cable and the voice could be understood. The whole result tends to show that conversation was possible with the coils introduced over a distance five times greater than without the coils.

## REPEATING COILS.

Repeating coils were born of necessity, the possibility of long distance lines having been established, their prolongation developed noisy lines; this necessitated metallic lines for toll lines but grounded lines were still in use locally and on connecting these to the metallic lines made them noisy, hence the development of the repeating coil; later the introduction of the central energy being grounded normally, necessitated the use of repeating coils either in the local cord circuit or in the toll cords. It was and is also used in some central energy systems to prevent leakage between cord circuits producing cross talk. It is also used in composite work, using telephone and telegraph over same line. Its principal function and duty in all these phases is to keep the line balanced. A balanced line is one in which both sides are of equal resistance, equal insulation and which latter should be high and the former low; this is necessary to neutralize inductive influences from outside disturbances. It is not my intention to consider lines paralleling street car or high tension systems, as this introduces the theory of transpositions, but a simple metallic line under ordinary conditions; and such a line should have all apparatus introduced or used, divided equally on both sides of the line so as to maintain the balance. If balanced, then the surplus induced current will (if a receiver is connected up) travel through this receiver and its variations will be noticeable; if, however, the line is balanced, no noise will be noticeable in the receiver. Now it is apparent that if we connect a grounded line to such a balanced line the balance is at once destroyed and the line becomes noisy; by introducing the coil, we are about to consider, the balance of the metallic line is retained (both lines being separated) and the currents from the metallic to the grounded are received by induction. Such a coil is called a repeating coil because it repeats, by induction, the originating current. Such a coil is usually made (in its simplest form) of two bobbins each containing about 2,500 to 3,000 turns of No. 30 single cotton covered wire and having a core made of No. 24 iron wire .01 in diameter; this wire must be well annealed and doubled over to form a closed magnetic circuit. Another form consists of four separate coils wound around an iron core. The output of such a coil will depend upon: (1) The number of ampere turns in the primary. (2) The number of lines of force cut. (3) The rapidity of the generating current. By arranging the coil into four sections it is possible to make several combinations and several different uses, whereas if only two sections are used then only one combination is possible. The coil may be designed for talking, for ringing, or both. A coil designed for a combination of ringing and talking or for ringing only, because of the slow frequency, would have more iron and be bulkier than for talking only; as in talking the average changes in wave motion are 1,500. In a coil for ringing, the resistance is higher than that used in talking. A coil designed solely for ringing would be very detrimental to good talking, hence a coil must be designed which while efficient for ringing through will not affect the talking too much. This is, however, a loss in talking efficiency in any repeating coil made, and so they should only be used where absolutely necessary. A good coil for a line say 125 miles long would be 250 ohms primary and secondary, and 6,000 turns, using No. 32 B & S wire. The latest specifications, for repeating coils, call for four separate windings using silk covered copper wire, carefully insu-

lated and brought out to eight terminals. These windings are over a core of finely annealed iron wire, the whole forming a closed magnetic circuit. When mounted along side each other, no leakage or cross talk should be noticeable. In local battery to toll a step up coil is not necessary and so a coil of 200 ohms each coil and 2,800 turns of wire, open magnetic short core would be good. In central energy to toll a step up coil is required having a ratio of 1 to 2 about 2,000 ampere turns in primary

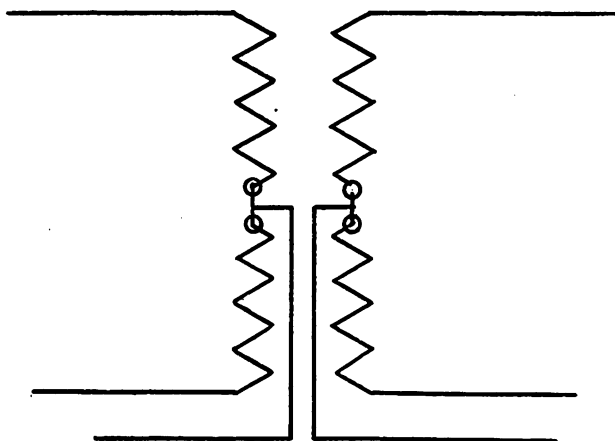


Fig. 5.—Symbol of Repeating Coil

coil and 4,000 turns in secondary, resistance 60 ohms for primary and 360 in secondary. The windings are paralleled through their entire length, each winding well insulated. A good ringing and talking coil has primary and secondary 5,000 turns each, resistance 125 each coil. It is possible to make many different combinations of repeating coils in central energy work such as feeding battery to the center of the coil, or to both sides, separated by a condenser or from either end and so on. It can also be used as a relay by fixing an armature at one end of the core. The loss in the best designed repeating coils varies from ten to fifteen per cent.; on poorly designed coils it is often as high as thirty per cent.

The graphic method of showing repeating coils is shown in Fig. 5. Repeating coils with solid iron cores are very much less sensitive than when made with fine annealed iron wire. It will be seen from what has been said that repeating coils may be used to step up voltage in a similar manner to electric light transformers, such stepping up increases the voltage and decreases the current. The following are some of the coils in use: No. 12 (Bell) 40 ohms each coil. Kellogg: Talk through 4 concentric windings.

1-2=72 ohms. 3-4=90 ohms. 5-6=100 ohms.  
7-8=120 ohms. Each coil 1257 turns of wire (local battery).  
Same as above for central energy.

1-2=22 ohms. 3-4=31 ohms. 5-6=37 ohms.  
7-8=45 ohms. 977 turns of wire for each coil.  
Same step up coil for toll lines.

1-2=22 ohms. 3-4=31 ohms.  
5-6=145 ohms. 7-8=187 ohms.

Talk through.

A=3 ohms. B=5 ohms. D=8 ohms.  
480 turns each coil.

Ring and talk 4 concentric windings. Boiler tube form.

A=45. B=56. C=66. D=76. 2400 windings each.  
Ring and talk.

A=90. B=112. C=136. D=160. 3330 windings each.

In a repeating coil each current wave traversing one winding, induces another wave in the other winding, the form of the wave being more or less modified. To this end and in view of the fact it is desirable that long lines

be made up of copper wire of high conductivity in order to reduce loss to the minimum where repeating coils are a necessary adjunct to the line equipment, and these coils to obtain the best results should not exceed ten per cent. of the resistance of the line; hence the coil used must be definitely proportional to the line. We find in practice, however, that coils are inserted without any consideration of the facts in the case, which is a mistake. The iron core should have the minimum hysteresis, hence very soft wires are necessary, and a closed magnetic circuit, the magnetic circuit being all important. The coils are so arranged that the inner coil of one side is connected to the outer coil of the other side, hence the primary and secondary consist of an inner and an outer coil. The capacity of a line is counterbalanced somewhat by the self inductance of the repeating coil.

### RETARDATION COILS.

Retardation coils are usually wound with silk covered copper wire, wound over a core of carefully annealed iron wire and when mounted close to each other should have the magnetic leakage kept down by being covered with iron shells; otherwise cross talk between the cord circuits may take place. When installed separately, as in substation sets, then the iron cover or shell is not necessary. Retardation coils are also used in generator circuits (Fig. 4) to overcome noise, a condenser bridged across the circuit working in connection with same. This is used when charging and using storage batteries at the same time. The noise is due to the hum of the commutator, each bar in passing under the brush causes a slight pulsation or break in the current. The introduction of retardation coils makes these variations uniform so as not to be detected, acting as a dam in a river; the condenser acts as a reservoir and stores up the surplus, charging and discharging in order to even up the conditions existing; each of these is a complement of the other and act in concert, evening up the inequalities in the circuit. The graphic method of showing retardation or impedance coils is shown in Fig. 6. Retardation coils are also used for intercommunicating systems, being placed in multiple

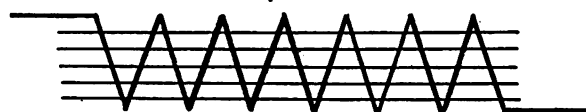


Fig. 6.—Impedance or Retardation Coil

with the primary or transmitter circuits to prevent the variations taking place from getting back into the battery mains and are connected in series with the transmitter, the impedance of the coils keeping back the variations when transmitter is in use. A condenser is sometimes used in conjunction, bridged across the transmitter and induction coil. The following are some coils in common use:

No. 7 coil (Bell) 10 ohms {  
No. 6 coil (Bell) 21.9 { 45 ohms common battery.  
No. 6 coil (Bell) 23.1

These coils may be made up in any resistance desired.

### INDUCTION COILS.

There are two styles of induction coils in use, but while somewhat different as to resistance the action is very similar. One is used in the central energy system, and the other in the local battery. In the central energy the windings are very nearly alike, while in the local battery

the primary is low and the secondary high. The customary coil used in central energy has the windings of 17 ohms in the primary and 30 in the secondary, about 1700 turns of wire in the secondary and 1400 in the primary; both windings being in the same direction. The action taking place in such a coil is that the current on circuit being closed, will leave the positive pole of the battery pass over the line through the secondary of the coil through the transmitter (hook being up) back to the other side or the line and ground at battery; legged off from this line connection is a 2mf condenser (Fig. 3) which becomes charged. Now in speaking into the transmitter a variation of the resistance takes place, the resistance being fixed when the transmitter is normal, the potential being lower in the transmitter than in the condenser, hence a discharge takes place from the condenser through the primary winding of the coil, the receiver and the transmitter to the other side of the condenser. This current being higher than the original current (on account of step up design of coil, really a transformer) and in the same direction will augment the return of the transmitter to normal and restores the potential to normal conditions. Such a condition makes a greater range possible in the current conditions on the line and helps materially the transmission. Induction coils are not covered with iron to make a closed magnetic circuit, for the reason that the closing of the magnetic circuit has a sluggish tendency, as the action taking place could not care for the

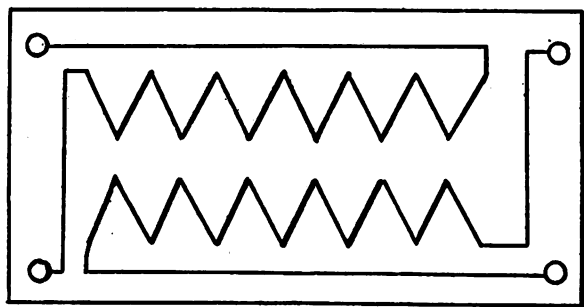


Fig. 7.—Symbol of Induction Coil

proper reproduction of the voice currents and would also entail an unnecessary expense. A graphic method of showing induction coils is shown in Fig 7. Induction coils are designed with a view to clearness and volume (or intensity). The following is a list of some of the coils in use:

Local Battery (Blake) Primary .5 ohms, Secondary 250 ohms  
 Central Energy;—  
 No. 20 Induction coil (Bell) No. 1 & 2=17 ohms (P) No. 3 & 4=25.7 ohms.  
 No. 19 Induction coil (Bell) No. 1 & 2=55 ohms (P) No. 3 & 4=25.7 ohms.  
 Local Battery Primary .35 ohms. Secondary .32.  
 Operators coil P=.35. S=200. P=64. S=68.  
 Operators coil P=65 ohms. S=90 ohms.  
 Kick coil—Primary=1.15. Secondary=135. for throwing drop in exchange.  
 Busy Back Primary—620. Secondary—12.  
 Operators coil—(local battery) 2 concentric windings primary 35—Sec'y 103.  
 Composite coil (split winding) P=.35. Split=47. Full coil=56.  
 Howler coil Primary=12.5. Secondary=9 ohms.

The design of an induction coil, as regards efficiency, varies with the purpose for which it is to be used; e. g., a coil made up of 111 turns of No. 22 wire to a resistance of .392 primary and 157 secondary, No. 18 wire in core, 4 inches long, 1/2 inch in diameter, shows an efficiency

of 72 per cent. on a short line and 86 per cent on a line nearly twenty times longer. Bell coil has primary 1.62 ohms 400 turns No. 26 B & S., secondary 22, 1820 turns No. 28 single cotton, core No. 28 B. W. G., iron wire annealed length of winding 3 in. These give a fair idea of what size a coil should be under ordinary conditions. No more resistance should be used than is absolutely necessary. In the induction coil any change in the lines of force in the coil will produce a state of pressure in the coil and if the circuit is closed current will flow. This induced current varies with the magnetic effect and will be proportional to the rate of magnetic change in lines of force. In the secondary the electro-motive force will be higher than in the primary but with less current, hence the increased pressure will force the current over a longer line than would be possible with a lower voltage and no coil. For this reason the primary in a local battery coil is of very low resistance compared with the secondary. The necessity for soft iron wires in the core is to enable the coil to respond quickly, and the less eddy currents present the better.

### NON-INDUCTIVE COILS.

These coils have no iron used either as a cover or as a core and may be wound to any desired resistance to suit requirements. A sample coil being made of a wooden spool solid wood center using No. 36 B & S. German silver wire wound to a resistance of 1000 ohms; same wire and spool may be used for 500 ohms.

### RINGER COILS.

Ringer coils are used in the signalling apparatus, being two to a ringer; in series work coils of 80 ohms per pair are used; in ordinary bridging from 1000 to 1600 and in selective party line work polarized 2,500 ohms. The spools are wound in same directions and over an iron core, the two spools being connected up in series.

Reported from Nome, Alaska, that the Seward Cooperative Telephone Company intends to cover all the populated sections of Alaska with a network of telephone lines, extending north from Nome wherever mining is in operation, up the Yukon river to Fairbanks, thence to Valdez, through the Copper River section, tapping all desirable mining districts. Many of the important points have already been covered, and the company, backed by ample means, is pushing the work toward completion as fast as possible.

A special dispatch to the New York Commercial from Columbus, Ohio, says that Frank L. Beam and Dwight E. Sapp, of Columbus, O., with Governor W. M. O. Dawson, State Auditor Sheer, Tax Commissioner Dillon, Henry G. Davis and Stephen B. Elkins, all of West Virginia, have secured control of the Charleston, W. Va., Home Telephone Company, intending to use that company as a basis for the consolidation of all the Independent lines in West Virginia. Governor Dawson, however, in a recent letter to SOUND WAVES says that no such project is on foot. The matter was mentioned, but simply as something ideal—a result which would be beneficial to Independent interests, but no steps have been taken to accomplish a consolidation.

Try a **SOUND WAVES** liner.

# Electrolysis on Cable Sheaths (II)

F. LUBBERGER

The phenomenon of electrolysis on lead sheaths is controlled entirely by Faraday's law, viz.: Amount carried away equals the product of time and current and a factor depending on the decomposed material. This fundamental law should be considered alone. In the following deductions I am going to show that almost universally this rule is not adhered to. What do you care for what happens to the rails of the street car system? You have to look out for your cable sheaths, for absolutely nothing else. Right here I will put down the keynote of the whole question. It is the current escaping from the cable sheaths which constitutes the danger. A method must be employed enabling the investigator to find: (1) The intensity of the current; (2) Where the current comes from; (3) Where it escapes from the cable. Knowing these three items, remedies may be applied at the right place. What would you think of a manager of a gas plant knowing about big leakage from his pipes, without investigating where the trouble is located, who would spend much money somewhere in the hope to remedy the losses?

It is almost safe to say that a good deal of the money spent for bonding the cables does not give any returns by way of real protection, and places not investigated being surprising losses. I know these expressions to be rather strong and I beg to be excused for them. But I cannot emphasize strongly enough that the danger lies entirely in the escaping current, no matter what voltages, what resistances, what bonding has been provided for.

The first task, therefore, is to find the troublemaker and then to remedy the fault. I will take up the usual methods of investigation and take the liberty to severely criticise some of them.

Men are sent out with a voltmeter. The manholes are opened and voltage readings are taken between the cable sheaths and the rails, gas pipes, water pipes, sometimes the surrounding ground also. For that purpose some people provide copper wires to be held firmly on the pieces between which the reading is to be taken. More systematic investigators provide sharpened steel points to safeguard good contact. It is supposed that "low" readings guarantee safety. In this method about everything is wrong from start to finish.

As you know, two different metals submerged in a liquid containing salts or acids form a co-called element. Voltages up to 2 volts can be obtained in this manner. If cast iron or malleable iron on one side and lead on the other side are imbedded in moist ground, there will be an electric pressure between them. This pressure depends on the solution. Usually the ground water contains impurities. If you find a difference of potential between the cable and a pipe, you will have to find out first what is due to the galvanic action of iron and lead in that particular neighborhood. This must be done by non-polarizing electrodes and it is so inconvenient that it cannot be described here.

Suppose the reading is 2 volts, and assume the galvanic action of lead and iron to be too small to be considered. The instrument indicates the rail positive, the cable negative. From this it is concluded that a current

is flowing from the rail to the cable. As current entering the cable does not do any harm, the place is considered to be safe. Now assume that a water pipe is not far away and a reading between this pipe and the cable shows 1 volt, pipe negative, cable positive, i. e., current is flowing from the cable to the pipe; i. e., cable is endangered. But now assume that right here you have no

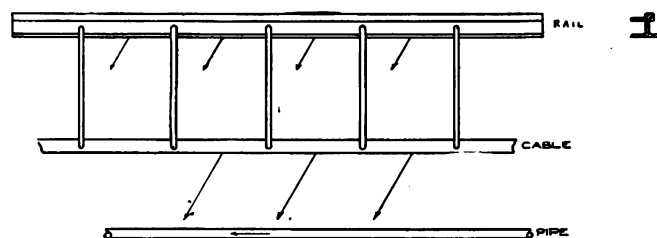


Fig. 1

chance to get at the water pipe. How then can you say definitely that no current escapes both from the rail and the cable to the water pipe? Although the bonding of the cables will be carefully treated later on, its result comes in here. A good connection between the rails and the cables makes them a single good conductor. Just as well as current escapes from the rails to the water pipes it may escape from the united system of rails and cables, even if the rail should be positive against the cable. In other words, a reading showing the rail positive does not guarantee the cable to receive current. The true direction of potential between the cable and the surrounding ground can only be found by measuring the sign  $+$  or  $-$  directly. Care must be taken that copper is not held on ground, as again a galvanic element would be formed. The only safe way is to use a piece of lead to make the ground connection.

Some people consider 2 volts between rails and cables as being safe. Two extreme examples will convince any man that this voltage does not indicate anything at all. It may mean safety and it may mean danger.

Fig. 1 pictures a rail track 2 miles long, and a cable well bonded to the rails. The ground is supposed to be moist and well conductive. The voltmeter deflections at the points 1, 2, etc. are scarcely readable, as good bonds

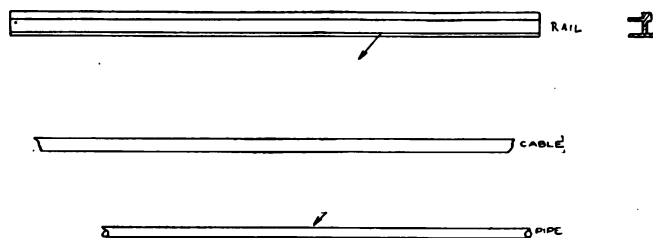


Fig. 2

absolutely short circuit the ground between rail and cable. If the railroad carries a heavy traffic the drop of potential over the two miles is large, and a heavy current will escape from the system rail and cable to the pipe. Please note this: the voltage between rail and cable is about zero, still a serious current escapes from the cable.



Fig 2 pictures also a track of 2 miles and a cable and a piece of pipe. As the ground is dry sand the cable will be absolutely free from current. Suppose the drop of voltage in the rail to be 20 volts over the 2 miles. It may be that the reading at point 1 is 3 volts between rail and cable and at point 5 23 volts, still absolutely no current enters or leaves the cable.

These two examples turn the usual view upside down. They seem to say just the reverse of the general opinion,

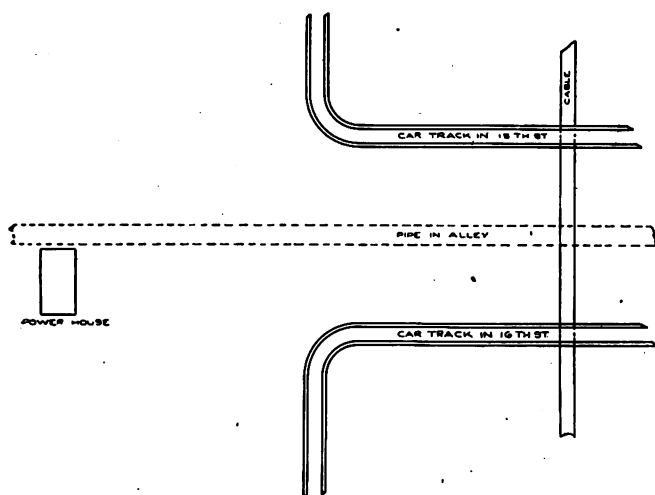


Fig. 3

namely, low voltage between rail and cable means danger, high voltage means safety. Of course they are extreme cases and I wish not to go on record with a new rule.

To say the truth, the voltage between rails and cables gives only reliable information if the condition of the resistance between them is completely known.

the town showing the cables and all pipes. A long study would have to precede any measurements.

Enough now has been said to condemn the method of measuring the voltage between rails and cables or pipes and cables. Gas and water pipes are subjected to the same troubles as the cable sheath. A great deal more damage has been inflicted on them, than on cable sheaths. Therefore more experiments have been made with this side of the problem. We telephone people can profit quite a bit by studying their methods. There is a method for two wires are stretched between the manholes, one wire leads to a voltmeter  $V$ , the other through ammeter  $A$ , and a circuit breaker,  $S$ , of any description. Two sets of readings must be taken. (1) Deflection of voltmeter while ammeter circuit is open. (2) Deflection of voltmeter and ammeter after closing the switch. Let the voltmeter reading be  $V_2$ , the ammeter reading  $A$ . Let the resistance of the cable sheath be  $R$ . Before the ammeter was closed the current  $C$  was flowing through the cable sheath, and as per Ohm's law, there was  $V_1 = C \times R$ . We do not know  $R$  or  $C$ . After closing the switch, the part  $A$ , of the current  $C$  is flowing through the shunt and only the current  $(C-A)$  passes through the cable. Again there is  $V_2 = (C-A) R$ . From these two equations

we receive  $C = A \frac{V_1}{V_1 - V_2}$ . As  $C$  is the current in the cable sheaths these simple measurements seem to enable us to find the disturbing element, the current.

But there are numerous difficulties in executing this measurement. The current  $C$ , is not constant. Fig. 5 shows a diagram of a set of readings between 4 o'clock to 8 o'clock in the morning. Before 6 o'clock we see the steady flow of galvanic current; after 6 o'clock the influence of the street cars is seen. The needle swings permanently back and forth over a wide range. The

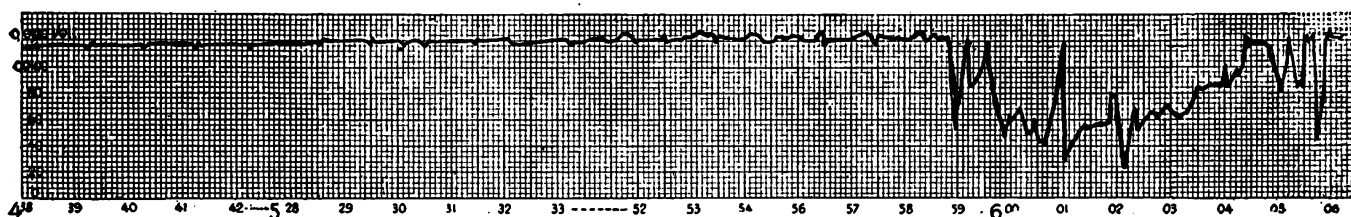


Fig.

Fig. 3 shows another extreme case: A track in the 15th, another in the 16th street, a pipe in the alley between same, and a cable crossing all three of them. The voltmeter shows both tracks positive; in the alley, there being no manhole, a reading cannot be taken. It is a matter of course that the cable will soon be destroyed at the

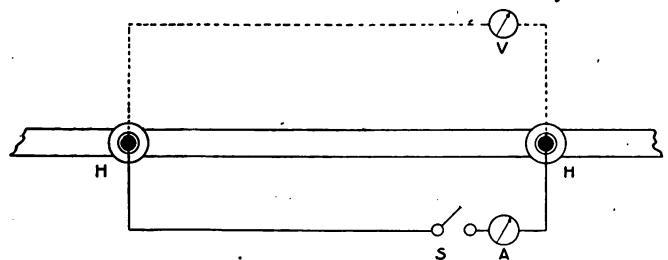


Fig. 4

crossing with the pipe as this pipe is the shortest way for return currents to the powerhouse.

So an investigation would have to start on a map of

period of the oscillations is 2 to 5 seconds. In other words, no method can be used depending on readings taken at a different time. It would be impossible to say what changes at the voltmeter are due to the closing of the ammeter and what were due to the changes of the current itself.

Another difficulty would come up even in case the current  $C$  were constant. A lead sheath has very low resistance, and usually only small currents are flowing in the cables. In order to deflect any amount of current from the cable sheath, a very low resistance shunt would have to be made. The ammeter wire would have to be about a No. 1 or No. 0 copper wire. Alone this necessity of carrying around a few hundred feet of such heavy wire makes the method impracticable for telephone people, not to mention the cost of the wire. Besides the impracticability the method does not give information enough. What we need to know is the escapement of current at a particular spot.

(To be Continued)

# Legal Notes

M. J. KEYS

A telephone company was recently restrained in New York state from increasing its charges for service to subscribers. The case was that of Wright vs. Glen Telephone Company and went to the Supreme court on appeal from Clinton county to an order overruling demurrer to the complaint.

H. D. Wright, plaintiff, alleged that the Glen Telephone Co., defendant, had obtained a franchise from the town of Gloversville, on condition that it would furnish service at a certain rate. Plaintiff was one of the petitioners for the granting of the franchise and the defendant company accepted in writing its terms.

The complaint also alleged that the increased rate was excessive.

The company contended that the transportation laws gave it a right to the use of the streets and alleys of the city and that therefore its contract was one sided and without consideration. The supreme court denied this contention, holding that the terms under which it permitted the company to make use of the streets were within its prerogatives and therefore constituted a sufficient consideration.

The point was also raised that the plaintiff was not a party to the contract with the city and therefore in no position to sue. The court held that the showing made him a proper party in a court of equity. The court also held that it can compel a public service corporation to furnish all citizens alike with its service at a reasonable and uniform price.

## Illegal Use of 'Phones.

That a telephone company cannot be compelled to furnish service to a person or corporation where there are reasonable grounds for believing that the service will be put to an illegal use was recently decided in the case of Cullen vs. New York Telephone Co., 94 N. Y. Supp., 290.

The action was one in which Cullen, the plaintiff, sought to compel the defendant telephone company to furnish him with service. The place where plaintiff sought to have an instrument installed was one which, prior to his tenancy, had been used as a cigar store in connection with a pool room. The place had been raided by the police and the instrument at that time in use, torn down.

The evidence showed that Cullen had been a frequent visitor at the place during the time the pool room had been operated and inferentially that he must have known of the illegal purpose to which the instrument had been put, to-wit, the furnishing of racing information.

The refusal of the telephone company to furnish Cullen with service was not absolute. The contracting agent of the company told Cullen that if he would write a letter to the telephone company stating that he would not and did not intend to use the telephone for illegal purposes and would give the company a reference, he would take the matter up with the general manager of the telephone company. The court in passing on the case held that the

assurance required was a reasonable one and refused to issue an order requiring the telephone company to furnish the service applied for.

## Servants' Right to Rely on Order of Foreman.

Earl T. Shaver, an employe of the Home Telephone Company was injured while unloading poles from a car in Clinton county, Ind. He brought action for damages alleging: That the poles were from 25 to 35 feet in length, piled 8 feet high on a flat car, being sustained in place by wooden standards on the sides of the car. These standards were placed three on each side of the car and were stayed in pairs by wire crossing over the top of the pile. That after removing most of the supports the foreman directed Shaver to cut the wire connecting the center standards and on having cut the wire the standard broke letting the poles roll from the car striking him. The complaint showed that plaintiff was not familiar with the work of unloading poles from cars; but he was alleged to be a man, twenty years of age and of ordinary intelligence. He knew that the wire assisted in keeping poles in place. Under the circumstances the court held that he was not entitled to invoke the rule that a servant in the absence of warning and notice has a right to presume that in conforming to the order of a foreman he will not be subject to injury, as the danger was obvious and the servant had ample time to see the danger and must have known it if he had used his senses.

The supreme court sustained the action of the lower court in granting judgment on the demurrer.

## Ohio Decision.

The decision of the Supreme Court of Ohio on telephone franchises will not have a sweeping effect upon telephone companies. It shuts the Independents out of Cincinnati, but there were no very large hopes in that direction. According to President Dickson, of the Cuyahoga Telephone Company, who is also a corporation attorney, the effect of the decision is principally to warn probate judges that they have no right to grant a franchise when the municipality has refused to give one. The probate court, therefore, cannot go over the head of the city council. But it does not limit the right of telephone companies to appeal from decisions of the city council to the probate court, and does not of necessity affect existing probate court franchises which have not been issued contrary to the wishes of the city councils. In both the Bell and Independent telephone business there are probably more probate court franchises than there are city. For obvious reasons neither side cares to attack probate court franchises as such. The effect of the decision will therefore be limited, in all possibility to the Cincinnati incident.

[If a probate court may not grant a franchise in defiance of the refusal of the council to grant one, of what value is the right of appeal from the council to the probate court?—Ed.]

It is expected that the automatic plant at Hastings, Neb., will be in operation about November 1.

# High Wound and Bridging Toll Service Problem

By H. P. CLAUSEN

Several months ago the writer prepared a series of articles, which appeared in *SOUND WAVES*, upon the problems which it is necessary to meet in order to supply toll service in connection with small exchanges. The original scope of the article was simply to give general suggestions as to the chief points which must be given consideration in rendering a satisfactory service. Different arrangement of clearing signals, repeating coils and condensers were presented for the cord circuits as well as the general discussion of the trunk system. However, since the articles appeared, the writer is in receipt of a communication from a correspondent who wishes to secure some advice as to the manner in which he should address a communication to the different manufacturers of telephone apparatus to permit him to secure an intelligent bid upon the equipment of his exchange with toll service. In response to this communication the writer presents the following suggestions:

Whenever an exchange reaches a stage in its development in which more than six or eight toll lines terminate in the switchboard, then it is best to consider the installation of a separate position or entirely separate board for rendering toll service. The first position of the switchboard may be equipped with, say, up to eight toll lines and excellent service be rendered providing that the cord circuit and trunking equipment has been properly designed.

Let us say, first, that we have eight toll lines terminating in or about to terminate in a switchboard and wish to secure an estimate from the manufacturers upon a suitable equipment. Then the inquiry should specify:

First, the total number of local operators' positions in the switchboard.

Second, the total number of lines handled by each operator.

Third, a brief description of the cord and line circuits, as well as a brief description of the drop and jack.

Next, a careful description of the character of the trunking system between the different positions. Or, if the board is of the multiple type, give a diagram showing the general layout of the switchboard so that it may be possible to determine the best location for the toll position.

After having given information upon all of the above points, then ask for a bid to equip a certain position with eight toll lines, drops and jacks, to operate in connection with toll lines to which are connected a certain number of telephones giving a certain class of service. (In describing the circuits of the telephones be sure to specify whether any selective arrangements are present, and also give resistance of the ringers as well as the total length of the longest line, together with the number of telephones upon it, and further, give the total number of telephones upon the line most heavily loaded irrespective of its length.)

Next specify that you wish to install six cord circuits, and if your board is of the local battery type with some lines grounded, call for three cord circuits to be equipped with repeating coils so arranged that the repeater may be cut out of circuit, leaving only the clearing out drop across the line and provided with means for listening independently either upon the answering or calling cord,

means for permitting the operator to listen across the line without materially cutting down the transmission between the connected subscribers, and further means to be provided so that the operator may speak and listen to the connected subscribers without separating the circuits of the calling and answering plug.

For the remaining three cord circuits specify that, in addition to the features contained in the cord circuit just described, they must contain the additional feature of permitting even the clearing-out drops being cut off from the circuit so as to leave a straight through connection from line to line without loading the cord circuit with anything likely to reduce the transmission.

In case the exchange, which must be supplied with toll service, is of the common battery type, then it will depend somewhat upon the character of the toll lines whether six cord circuits are sufficient. If most of the service is between the toll lines and the local exchange, then at least five cord circuits should be arranged for a toll to common battery service and three cord circuits equipped for toll to toll service.

The same specification as applied above for toll to toll and toll to local, should apply in the present instance, with the exception that no repeating coil cut-out key need be installed in the toll to local cord circuit, and that lamp supervision must be had upon the local side of the toll to local cord circuit, and drop supervision upon the toll side.

Of course the supervision on the answering and calling cord may be of the lamp type on both sides. This for the toll to local. Generally, however, this is a matter resting entirely with the exchange management and depending somewhat upon the expense, for the drop supervision is always less expensive than the lamp supervision, it requiring either a compound relay or two relays together with a lamp, lamp jack and prism to supply the lamp supervision, whereas the drop supervision simply calls for a straight ring drop.

Now with reference to the trunking equipment, if the switchboard is of the transfer or divided central type, then the toll operator must be provided with outgoing trunk circuits terminating in spring jacks at the toll position, and ending in plug and cord before the different operators throughout the switchboard. At least two cords should terminate at each operator's position. Thus, having five positions installed, at least ten cord circuits should be distributed along the board so that the toll operator may order up any of these plugs into any desired line jack.

In connection with these service trunks, it is always best to specify that at least the toll board end of the said circuit must be provided with lamp supervision so that when the toll operator takes down the connection the local operator must be ordered to remove the trunking plug from the line jack. As a rule, however, the double supervision finds most favor, in which the lamp lights both at the trunking plug socket as well as at the trunking jack on the toll position.

With respect to handling toll service from the local subscriber to the toll operator, it should always take the form of a recording trunk. That is, place a drop before the toll operator terminating in a spring jack and let

this terminate along the switchboard in jacks so that any operator may plug into a certain jack when receiving a call for toll, and project the usual calling signal. The toll operator will respond to this in the usual manner, and before taking down the connection, after receiving a local subscriber's order, project an impulse of generator current over the trunk, and thus insure the local operator taking down the connection.

Of course, all this ringing off operation is dispensed with when the switchboard is of the common battery, automatic disconnect type.

In the event that the switchboard is of the multiple type and a position is available in which the toll lines may be installed, then the service trunk need not be called for. The toll operator upon receiving a call for a local battery subscriber, may plug directly into the multiple (therefore the toll operator's plug and jack must be interchangeable with the multiple jack already in the switchboard). The recording service from local to toll is handled in precisely the same manner as in a divided central switchboard.

Now that we have covered, in a general way, the matter of rendering toll service to say, eight lines, and terminating these lines before an operator occupying a position in the main switchboard, we will discuss the question of rendering toll service, say to sixteen toll lines:

When the total number of toll lines terminating in an exchange reaches, say over eight or ten lines, then it is false economy to attempt to give toll service from the main switchboard. A separate toll board must be installed and placed in a separate room so as to be isolated so as to render the most efficient service.

Say, then, that we make our request upon the manufacturers as follows, after having given all of the information regarding construction of the switchboard circuits and condition of telephone lines, circuits and connections:

"Quote us upon a toll line switchboard to operate successfully in combination with the switchboard and circuits described above, and consisting of a two position equipment, each position having provisions for an immediate equipment of eight toll lines with provisions for permitting an ultimate extension to ten lines, with space provided for the future installation of ten additional toll or farmers' lines. The line signal is to be of the drop type. Each position must be further provided with ten outgoing trunk service circuits terminating on the main switchboard in trunking plugs, also with supervisory signals so arranged that when the toll operator takes down a connection the local operator receives a signal which serves as an indication that the connection shall be taken down.

"Further, supply the toll board with incoming trunks provided with either lamp or drop signals and terminating on the main switchboard in multiple jacks within reach of any local operator throughout the switchboard. Each position shall further be provided with eight cord circuits; four of these cord circuits to be arranged for connecting toll to toll, and the remaining four suitable for connecting toll to local lines. Each toll to toll cord circuit shall be equipped with means for permitting the toll operator to independently speak to a subscriber connected to either the calling or answering cord circuit.

"Means shall further be provided for permitting the operator to speak to the subscriber as they are connected together, and also to permit the operator to listen in upon the circuit without reducing the efficiency of the transmission appreciably. And finally, a key shall be installed by which the repeating coil may be completely disconnected

from the cord circuit, leaving the clearing out drop across, and also another key should be installed for taking off the repeating coil and clearing-out drop so as to leave the cord connected straight through, thus securing the most efficient service possible.

NOTE. Under no circumstances shall the winding of the repeating coil be left across the cord circuit so that it serves as a condenser and thus reduce the transmission. That is to say, one limb of the primary of the repeating coil must not be left connected to the tip side of the line while the remaining limb is connected to the sleeve side, it being contemplated that both limbs must absolutely and completely be severed from the cord circuit.

In this connection it may also be mentioned that the line drop and jack must not be so arranged that the winding of the drop remains on one side of the toll circuit. The jack must be of the double magneto type."

With respect to the toll to local cord circuit, the same specification as indicated above must prevail; with, of course, the modification that the repeating coil need never be cut out of circuit, nor need any keys be provided for cutting off the clearing-out signal from either the answering or calling cord.

It is desired that the proposition upon the toll equipment be based upon using either lamp supervision for the toll side of the cord circuits, or lamp supervision, as preferred by the manager, it being required, however, that the local side of the cord circuit be provided with disconnect signals operating similar to that of the local exchange service.

In addition to equipping the toll board with suitably arranged operator's telephone equipment, it is required that it be provided with some satisfactory type of time recording stamp. The two positions board must be so arranged that at any future period additions may be made either to the left or right, and permit of the cabinet work matching in a proper manner.

As a general guide for the method of operation between toll to local subscribers, the following method of operation is submitted as meeting, in a general way, the chief requirements:

## OPERATION OF TRUNKING SYSTEM BETWEEN TOLL AND MAIN SWITCHBOARD.

### TOLL ORDER TRUNKS.

The system which shall be installed contemplates the provision of trunking jacks for the local exchange operators which shall terminate in spring jacks provided with signals to be mounted upon the toll line switchboard.

### TOLL TRUNKS TO "B" BOARD.

The toll operator shall be provided with spring jacks terminating in trunking plugs which shall be placed on the first position of the local exchange or "B" board. The trunking plugs shall be associated with signal lamps which shall notify the local exchange or "B" operator to discontinue the connection. There shall be provided order keys upon the toll line switchboard which shall serve to connect the trunking operator's telephone circuit with the toll operator's telephone circuit.

### OUTGOING TOLL CALL FROM LOCAL.

The system as installed shall provide means whereby any local exchange subscriber is positively prevented from having toll calls coming from his station charged to another local exchange subscriber by reason of his giving another number than his own.

## SUPERVISION OF TOLL CONNECTIONS.

The system, furthermore, shall provide means whereby all toll calls are directly under the supervision of the toll operator, thus making the toll operator alone responsible for the records of such connections

## OPERATION LOCAL TO TOLL.

The operation of the system shall be substantially as follows: After a subscriber sends in his call and receives a response from the local exchange operator, the subscriber shall be advised to call for the toll switchboard. The local exchange operator shall pick up her calling cord and effect connection with a trunking jack which is in direct connection with the toll board as hereinbefore set forth. This operation shall result in lighting the lamp at the trunk terminal on the toll line switchboard. The toll operator, upon observing the signal, shall place an answering plug into the corresponding trunk jack and shall thereby extinguish the supervisory lamp or signal associated with the calling plug of the local exchange operator's cord circuit. The local exchange operator shall thus not be required to perform any more than the usual operations required for interconnecting two subscribers, the called subscriber in this instance being represented by the toll operator. Upon receiving the signal the toll operator shall plug into the trunking jack and shall thereby obtain connection with the calling subscriber and ascertain from him with which circuit he desires connection, and shall likewise inquire of the calling subscriber the number of his telephone. Having obtained the desired information, the toll operator shall request the subscriber to wait a few moments and shall thereupon release her talking circuit from the calling subscriber's circuit, but shall permit the answering plug to remain

in the trunking jack as during conversation. The toll operator shall, by means of her order key, place herself in communication with the "B" operator, at the same time placing a connecting plug into an outgoing trunk jack terminating in an incoming trunk plug before the said operator and instruct the "B" operator to place the designated trunking plug into the multiple jack corresponding to the number as given by the local subscriber to toll operator. In this manner all possibility of a wrong charge of toll call is prevented. Upon performing this portion of the operation the toll operator shall withdraw the answering plug from the trunking jack, which operation shall effect the actuation of the supervisory signal in the local exchange operator's cord circuit, whereupon said local exchange operator shall remove the connection between the calling subscriber and the trunk line. The toll operator shall then proceed to establish the called for toll connection in the usual manner. The supervision over the connection shall be with the toll operator who shall receive the usual clearing-out signal in her cord circuit when the subscribers have completed their conversation. Thereupon the toll operator shall withdraw the connecting plugs from the trunking jacks which shall result in lighting the accompanying lamp in the trunking operator's position, whereupon the trunking operator shall withdraw the trunking plug and thereby render inoperative the lamp or signal.

## OPERATION TOLL TO LOCAL.

An incoming toll call shall be received by signal at the toll board and a toll board operator shall, after having ascertained the desired connection, order up said connection from the local exchange operator through the agency of her order wires and keys. The connection shall then be formed by means of the trunking plug as before stated.

## A Version of Depreciation

By J. C. KELSEY

This topic seems as old as the hills. It has been discussed by lawyers, judges, college professors and engineers, time and time again, and yet we have no solution.

Why have we no solution? Because there is no solution. Depreciation is purely a local condition. What obtains in Pawtucket is not necessarily a rule for Nantucket.

There is no question that depreciation is a factor that must not be ignored among our telephone interests. Some utterly ignore it, others pay some slight attention to it, and others insist upon acknowledging its existence.

We have all been taught, in our schools and copy books, that we should save for the proverbial rainy day. Since childhood's first happy hours, have wise parents urged the necessity of saving for the time when days are dark, and the future looks hopeless and dreary. In nature, the bees, and the ants recognize this principle of the rainy day, and they labor hard all during the summer months.

Surely a telephone corporation is not one whit unlike the individual. There are rainy days in the life of the telephone company when their financial future looks hopeless. The rainy days for telephone corporations are sleety days and windy days when the forces of nature disport themselves among man's feeble toys. When the

sport is ended, and the poles and wires are flat, and the service is stricken, then does the manager and his directors look longingly toward the rainy day fund, if they have one. It there one? Does your company have a rainy day fund, or a reserve? Well, look out, if you have not, for "into each life some rain must fall. Some days must be dark and dreary."

But this forecast seems pessimistic. Is it? Well, it is. It is contrary to human nature for a soul to be anything but optimistic. Pessimism is born of dyspepsia, and kindred evils. If every man knew that he had to die at the age of 33, he would work blithely along to the last moment, satisfied that he, for one, would be the exception to that rule. The exchange manager sticks his fingers in his ears when it thunders. Shuts his eyes when lightning flashes, and hunts his cave when the wind blows, but he blithely hopes that these above functions will safely pass over his property. But is depreciation based on acts of God, such as winds, sleets, fires and lightning flashes? No, not necessarily! We have heard representatives of Bell companies on the witness stand justify their claim of high maintenance and depreciation by vague intimations of vast sums needed for such acts of God. We do not live in a Mount Pelee type of country. We don't have Johnstown floods very often. We don't



have Chicago or Baltimore fires very often. We find it possible to guy our lines, to arrange our wires, and to protect our exchanges and instruments from lightning flashes, thanks to efficient arresters. What is it then, that demands a notice of the depreciation question to have a reserve, a rainy day fund?

Depreciation or reserve is a provision which provides a fund which will balance the loss on destruction of that material or apparatus which wears out, or becomes useless, an ordinary duty, in spite of the function of human effort toward up keep or restoration, which efforts are classed as maintenance expenses.

For instance, take a far-fetched case of an automobile tire. In a short time, in spite of human effort in maintenance, this tire will wear completely out or become useless. In this case depreciation is apparent, and inevitable.

An opposite instance is a house in a desirable neighborhood. There is a wear and tear on the house, which keeps the carpenter, plasterer, painter and paper hanger busy at certain times of the year. As each part wears out, it can be replaced, for instance, a rotten porch. At any time, owing to the facility of maintenance, this house is as good as ever. The only depreciation that could possibly be anticipated is a decline in the desirability and respectability of the neighborhood.

Now a telephone system has some parts which cannot be repaired. But they are not vital. They will wear out and become useless, like the tire. The wireman, lineman, plumber, and electrician exert their skill to keep the property up to a high state of efficiency, and succeed. Like the house, it looks as if it is not subject to depreciation, unless it should happen to be located in a city which was on the down grade.

From this, I want to repeat that depreciation is a local condition purely. What will be proper in that wonderfully well managed property in Johnstown, Pa., will not be proper for an equally managed property elsewhere. In ordinary language, I repeat, what satisfies Pawtucket conditions might not satisfy Nantucket conditions. A property not well kept up might be in a growing city, where the property as a whole increases in value by reason of increased utility, flexibility, and toll terminal value. Then the gain in value would entirely offset any need of a reserve. Or a well managed property might be in a dying city, where all its functions are decreasing in value. Then the loss must be offset from operating earnings. No possible human effort can maintain this plant, just like a man dying under a skilled doctor's hands, hence a local conception of depreciation is necessary here.

No wonder the judges, the lawyers, and the engineers differ. Each man has a local condition in mind.

There are five general conditions of telephone properties, from the depreciation standpoint.

First. Let us consider a local battery system in two prosperous counties, having two towns of 3,500 each, with a half dozen other town exchanges and many rural subscribers. This company has 2,500 subscribers, owns no real estate, has no conduits, and all work is overhead. This plant is kept in good condition, and is typical of the best enterprise in such a locality.

Second. Let us consider a common battery plant in a city of 35,000 people, renting their exchange quarters, having a limited underground district, and using mostly overhead cable and wires. This system has 2,500 subscribers, the activity of the city is normal, and property well kept.

Three. Let us consider the conditions of Case 2, with the exception of owning their own office building and real estate, and having quite a comprehensive underground system, with pole top distribution. Also the town is very busy, and growing.

Fourth. Let us consider a large city. Say 250,000 people, with several branch exchanges, owning all real estate, having a fairly well defined underground district, with overhead cables and wires in outlying districts, and serving 15,000 subscribers.

Fifth. A still larger city of 1,000,000 people, with several branch exchanges, owning all real estate, having all wires underground and serving 50,000 subscribers or more.

These five cases are typical exchanges, and let us try to get at a reasonable depreciation percentage considering the plant as a whole, not necessarily on the capitalization, but a percentage of the real material value of the plant, and not of its water, possibly.

The first case reveals a nice average small town property, with low operating expenses, and situated in a farming country, which is practically at a standstill by reason of the natural conservatism of a farmer and a small town merchant. The property can hardly be called an appreciating one, on the score of rapid growth, due to growth of population. The addition of each telephone in a conservative way does add an increment of value to the other telephones. They have no real estate gaining in value. There are no wires underground, and freedom from violent storms is not guaranteed. The poles, wires and overhead cables are exposed to the weather, and a certain wear takes place in spite of all human efforts. Not owning property, there is liability of being compelled to move by some greedy landlord. The equipment will be kept up by the maintenance force, and they will do it well, because there is nothing difficult to repair. If depreciation is to be considered, it is to be considered upon the entire plant, for no part of it is appreciating. For *sake of comparison* with the four following cases, I shall claim a suitable reserve to be 8 per cent. of the total value, on a basis of twelve and one-half years.

The second case too is in better shape, as regards depreciation. It is too bad that it does not own its exchange property, for undoubtedly a town of this size is growing, hence an appreciating value is absent, which could bring down the total depreciation percentage. The limited underground district is not particularly an appreciating property, but it reduces certain losses due to exposed position. The underground cables and ducts are a good feature, and place the reserve or depreciation in the *six per cent* column.

Case 3 is a system in a growing city with a good future. They own their office building and real estate, and each year adds considerable value to the original value. Their comprehensive duct system is not a depreciating property because each succeeding year reveals the wisdom of such work. And it is really appreciating. But with underground cables and pole top distribution, the maintenance is reduced, the number of trouble hunters reduced, operating expense is low, and such a plant may be said to come under a *four per cent reserve* class.

I have in mind a company in this class whose stock can't be bought, and whose operating expenses are \$9.00 a year. Case four is a system in a large and growing city, which has exceeded by far its original expectations. It has considerable overhead wires and poles and cable, but it has a fine duct system with surplus space, which

can be rented to minor companies. Its real estate value is advancing, and on the whole, it has very little property that cannot be maintained at highest efficiency. Hence the depreciation charge or reserve is in the *three per cent* list.

Case 5 is a system in a large city of a million inhabitants, with a complete underground system, and owning real estate which is advancing in value. Its underground system guarantees safety from storm, and its daily care guarantees the lowest maintenance charges. The comprehensive duct system is a golden asset, and an appreciating property as sure as one lives. Its surplus duct space will find a ready renter, and it will last indefinitely. It is said that concrete work done by Julius Cæsar is still in good condition. The franchise itself is an appreciating property. A franchise in a city of a million, gotten for practically nothing, is a gold mine, inexhaustible. I venture to say that the appreciation of real estate, ducts, and franchise of a property of the 5th class case, will more than balance the depreciation of switchboard, cable, and instrument, if all were reduced to an exact science. But I am going to put case 5 in the *two per cent. reserve* column.

So far I have made only comparative reserve percentages. I won't assume even that the percentage against each case is true. If one is true, all are true. But the character of the property, its location, its management, the enterprise of the citizens in the place, all have a bearing on the proper reserve.

Some properties coming under case 4 might be justly charged more than 3 per cent. It might be five.

Another great feature determining proper reserve is the rate of growth. A property which is adding new subscribers is virtually an appreciating property, and no reserve is needed. If money is needed, let the increments added to the system by reason of growth be capitalized and money realized.

But when a property of any class is at a standstill, then it becomes a depreciating property sure enough, and operating earnings are necessary to balance the condition.

Some companies point to increased earnings, and insist that it takes care of depreciation. It is a good ground.

If John Smith puts in 500 telephones in one year at \$50 each, and the following year 500 more at \$50 each, in a desirable locality, he creates an appreciating condition by reason of increased utility, flexibility and toll terminal value. His property cost him in two years, \$50,000. But it is worth \$60,000 or more. He has had depreciation, but he can ignore it, when with no effort of his own, that property has gained \$10,000 in value.

Suppose John Smith adds another 500 telephones in another desirable district during the third year. This costs him \$50 a telephone. But the increased utility flexibility and toll terminal value make his property not worth \$75,000, what is cost, but \$105,000. Suppose Smith added 500 more during the fourth year at \$50 each. He has spent \$100,000, but his earnings make it worth \$160,000. There has been depreciation in these four years, but he has \$60,000 appreciation to offset it.

Suppose John Smith kept on this way every year. You ask, would he ever have any need of a reserve. No! But a day comes when John Smith quits adding telephones. His property has reached its highest earning power. It has ceased to be an appreciating property. Then John Smith has to have a reserve out of operating

earnings each year; or to take away from the appreciation fund which represents his physical profits.

But supposing John Smith had all this nice property, and needed money real suddenly. He would have to sacrifice some of his property to get it. Then he would see that he should have been creating a reserve all these years.

Therefore, no property is exempt from the necessity of creating a reserve, which may be called upon at critical times, which no man or company can escape. What it should be is dependent upon local conditions, and there are many phases to these local conditions. By all means, create a reserve, each and every Independent telephone enterprise. It will interest you, as a savings bank book interests a boy. You will take pride in watching it grow, and some day you can take pride in your wisdom.

The eighth district of the Indiana Independent Telephone Association held a meeting at Cambridge City recently.

The Central Nebraska Toll Line Co. has just completed its copper toll line as far west in Nebraska as Grand Island, thus making an excellent line from the Missouri river half way across the state. It is built of No. 10 copper, with 40 7-inch top, 25 foot poles to the mile. This connects Lincoln with all the chief county seat towns in central Nebraska.

In a previous issue we reported that an Independent company had applied for a franchise in Omaha. Recent press reports indicate that the city council refused the application. T. H. Pollock of the Plattsmouth (Neb.) Telephone Company, one of the promoters of the proposed plan, says that now, however, prospects in Omaha are brighter and that they do not feel in the least discouraged. "We have only begun to fight," says Mr. Pollock, "and are confident of securing our franchise within the next few months, and will keep after it until we do."

The Southwestern Iowa Independent Telephone Association met at the Grand Hotel, Council Bluffs, on Oct. 28. George T. Hewes read a paper on "The Clearing House Proposition;" "Independent Contracts" was discussed by C. C. Deering of Boone. S. S. Lichty of Vinton addressed the convention on "Connection Contracts," while Clarence H. Judson, construction engineer of the Council Bluffs Independent Telephone Company, ably handled the topic, "Telephone Construction." The last address on the program was delivered by P. C. Holdoegel of Rockwell City, who spoke on "Harmony."

A method of ascertaining the depth of water by means of the telephone is being employed in the German Navy, says the *Deutsches Offizierblatt*. Sound waves are given out which disperse in all directions at a known rate of speed. Those which strike the ground at the bottom of the water are reflected, and the times of their dispatch and return to the instrument are recorded. The velocity of the sound wave being known, it is easy to calculate the distance traversed. It is needless to say that the recording instrument has to be extremely sensitive and delicate in order to give records of any value.

**Begin the New Year right by subscribing for SOUND WAVES.**

# Review of Telegraph and Telephone Industries

The address of Mr. John Gavey, delivered recently upon his induction into the office of president of the Institution of Electrical Engineers of Great Britain, gave a fairly comprehensive review of the development of the telegraph and telephone industries. Mr. Gavey described the development of telegraphy in railroad, and other work, the developments in submarine and underground cables, and the several systems of wireless telegraphy in use. With regard to telephony, Mr. Gavey said in substance:

"Not the least important of modern developments of electrical engineering is the extraordinary growth of the telephone service throughout the entire world. Subsequent to the year 1860, when Reis invented his musical telephone, it was thought by many that no further approach toward the attainment of articulate speech could be made. The possibilities attending the use of loose contacts—at that time the most dreaded enemy of the electrical engineer—had not been foreseen, and the conclusion was generally arrived at that it would be impossible to devise a transmitter free from the defect of causing actual breaks in continuity, so as to admit of the delicate curves necessary for the transmission of articulate speech. The work of Bell and others, and the development of the modern paper-insulated cable, led to the general adoption of the one main factor in satisfactory telephone work—the use of well-insulated metallic circuits constructed so as to be free from cross-talk. This opened the door to the use of the very best types of telephone transmitter, and paved the way for the successive improvements in exchange plant that are so marked a feature in modern systems, and have led to the extraordinary increase in telephone statistics that has taken place in the last ten years.

As a result of successive inventions and study, a rapid improvement in the indoor plant available for exchange work has taken place, and so far as the modern telephone switch is concerned, these improvements have been wholly in the direction of reducing the amount of talk on the part of the operator that was necessary under the old conditions. This has been brought about by the provision of a complete system of automatic signaling. This tendency to reduce the operator to a species of intelligent automaton naturally suggests the possibility of the entire elimination of the operator and the introduction of suitable automatic apparatus at the exchange. Several very ingenious methods of attaining this end have been devised. Several exchanges of some magnitude have been fitted with automatic apparatus in America, and two or three small automatic switches have been installed in Europe, but no European administration has yet faced the problem of establishing an extensive automatic system for the use of towns in which large exchanges are required. The subject is, however, being carefully studied, and there appears to be some possibility of development in the not distant future that may lead to important modifications in present methods.

The determination of the distance over which telephonic speech is possible in various types of telephone circuit is a question of the greatest theoretical and practical interest. It is one that has received much careful consideration. The theoretical investigations of Clerk

Maxwell, Kelvin, Heaviside, Campbell, Pupin and others have done much to elucidate the problem under consideration, and we are now fairly well acquainted with the various factors that govern and limit the range of possible speech, and the methods by which these limits can, under favorable conditions, be extended; such, for example, as the partial neutralization of the effects of static capacity by the addition of self-induction. As the preliminary to the determination of the limits of speech, it is necessary to ascertain the degree of volume and articulation; or, in other words, the conditions which may be accepted as satisfactory; and, further, to establish standard circuits with well-known constants of resistance, inductance and capacity, to which all lines may be reduced, either by calculation, by experiment, or, preferably, by both. For this purpose, both in America and England, one of the types of ordinary lead-covered, paper-insulated cables in which the above constants are measurable has been selected. In considering this question from the practical point of view, it is necessary to take into account the variable conditions under which long-distance speech is frequently held. The insulation of long overhead wires may, in the climate of England, drop in extreme cases to a figure as low as the metallic resistance of the conductors themselves. Slight inductive noises are never really absent, and occasionally they preponderate. It is difficult to obtain even an approximately perfect static balance between a telephone circuit and the neighboring wires subject to rapidly varying potentials. Again, the human element largely affects the result. It may be said that the limits of error in calculation, whether the empirical or more accurate formulæ are used, are less than the limits of variation in practice, and that there must always be a considerable factor of safety to ensure satisfactory intercommunication. Telephone administrations have carefully considered what are the extreme limits of effective commercial speech. It is generally considered that from forty-two to forty-six miles of the above-named standard cable is the effective commercial limit, although conversations have been held by experts over sixty miles of such cable.

There are two methods of determining the limits of speed over various types of telephone circuits. The first is the application of Pupin's formula; and the second is a direct comparison of all existing types of line with the standard cable. The British post office has conducted a lengthy series of experiments to enable it to rate its cables, and has also been investigating the problem of telephonic transmission by means of the Duddell oscillograph. This instrument was employed for observing simultaneously the curves due to the action of the induction coil at the transmitting end, and the corresponding curves at the receiving end of the circuit. A number of letters, both vowels and consonants, have been rapidly spoken into the transmitter, and the respective transmitted and received curves for each have been recorded in the usual manner. The curves obtained show that over short distances there is no appreciable change in their shape, but when longer lengths of cable are introduced, the difference of amplitude is most marked, although the shapes of the two curves bear a substantial resemblance. Curves plotted from readings taken on the post office

cables show that on short lengths self-induction predominates largely over the capacity. As the length of the circuit increases, the curve first rises, but as the capacity effects increase more rapidly than the inductances, the curve reverses and falls.

The postoffice has taken up the addition of self-induction to telephone lines to neutralize the capacity. In one case a cable containing fifty-six 100-pound conductors was loaded by the insertion of coils at intervals of a mile. The original factors were seventeen ohms resistance, 0.053 microfarad, 1.4 henries. The added inductance brought the total up to forty mil henries, the resistance being increased to 23.34 ohms. The equivalent range of speech was, however, increased from 66 to 176 miles. Very satisfactory results have been obtained in America and in Germany by the use of ring coils of extremely fine iron wire cores. The coils used at the post office con-

tained no iron in any part. Experiments with overhead conductors proved not as satisfactory as with underground cables. The variation in the insulation of the open wires upsets the balancing due to the coils, and lightning troubles have affected coils. For the present, at all events, this method of increasing the range of open conductors of limited gauge can not be considered so satisfactory as the corresponding results with underground work; and opinions as to the future of open wire loading appear to be somewhat divergent.

Among the unsolved problems touched upon were the need for a more perfect receiver for wireless telegraphy, the production of a satisfactory telephone relay, the finding of a substitute for gutta-percha, to be used in submarine cables, and the further development of the modern telephone switchboard.

## Plan of Handling Interchanged Toll Business

### MILEAGE.

We recommend that the air line mileage between any two given stations be used as a basis for determining tariff between the said stations, and that the United States post route map be adopted as a standard for determining air line distance; that for the purpose of facilitating the computing of mileage tables the so-called Ohio block system be adopted, and mileage tables be made up of distances between centers of block, the air line distances adopted between any two stations being the distance between the centers of the respective blocks in which said stations are located.

We recommend the adoption of tariff rates based on a minimum charge of six-tenths cent per air-line mileage for each conversation not exceeding three minutes duration, but recommend the adoption of special rates necessary to meet competition.

We also recommend that the minimum rate between any two stations be fixed at ten cents, and submit the following scale of rates, based on air-line distances, subject to correction by special rates necessary to meet competition:

Stations in same block	\$	10
10 to 19½ miles	15	
20 to 24½ miles	20	
25 to 29½ miles	25	
30 to 34½ miles	30	
35 to 39½ miles	35	
40 to 44½ miles	40	
45 to 49½ miles	45	
50 to 59½ miles	50	
60 to 69½ miles	55	
70 to 79½ miles	60	
80 to 89½ miles	65	
90 to 99½ miles	70	
100 to 119½ miles	75	
120 to 139½ miles	85	
140 to 159½ miles	1 00	
160 to 179½ miles	1 10	
180 to 200 miles	1 20	

The above rates subject to special rate charge to meet competition.

### TIME LIMIT.

We recommend the adoption of a three-minute time limit for all toll messages, with the following charges for each additional minute in excess of the three minute limit.

First Three Minutes.	Each Additional Minute.
\$0 10	\$0 03
15	05
20	05
25	05
30	10
35	10
40	15
45	15
50	15
55	20
60	20
65	20
70	25
80	25
85	30
90	30
95	30
1 00	35
1 05	35
1 10	35
1 15	40
1 20	40
1 30	45
1 40	45
1 50	50
1 60	55
1 70	55
1 80	60
1 90	65
2 00	65
2 25	75
2 50	85

We recommend the use of time recording devices on all toll boards wherever practicable.

### NIGHT RATES.

We recommend the adoption of the following night rates between the hours of 6 p. m. and 6 a. m.:

Day Rate.	Night Rate.
\$0 10	\$0 10
15	15
20	20
25	25
30	25

35	25
40	25
45	25
50	25
55	30
60	30
65	35
70	35
75	40
80	40
85	45
90	45
95	50
1 00	50
1 05	55
1 10	55
1 15	60
1 20	60
1 25	65
1 30	65
1 40	70
1 50	75
1 60	80
1 70	80
1 80	90
1 90	95
2 00	1 00
2 25	1 15
2 50	1 25

#### DIVISION OF TARIFF BETWEEN TOLL LINE COMPANIES AND EXCHANGES HAVING NO TOLL LINE MILEAGE.

We recommend that all stations originating toll messages be paid, as compensation therefor, a commission on all toll business originated whether sent paid or sent collect.

#### DIVISION OF TOLL REVENUE BETWEEN TOLL LINE COMPANIES.

In the division of toll revenue between toll line companies we recommend that after deducting the originating commission, the remainder of the total toll tariff be divided between the connecting companies in proportion to the ratio existing between the air-line distances from point of origin to the point of transfer, or switching point, and the air-line distance from the point of transfer to the point of destination, each toll line company assuming the mileage of and settlement with its own connections.

#### REPORTING TOLL BUSINESS.

We recommend that each exchange, or toll line company, make a monthly report embodying a full statement of business sent and business received by it to the toll line company with which its settlements are made not later than the 10th of the following month.

#### METHOD OF HANDLING TOLLS.

We recommend the adoption of the following general rules to govern the transmission of toll messages:

Toll operators at stations originating calls to answer calling subscriber by saying "Toll" only. After subscriber gives name and address of party with whom he desires to converse, operator to ascertain name, address and telephone number of calling party, and immediately record same on a ticket furnished for that purpose. If a messenger is required to reach party wanted, or if there is a long delay, originating operator to report back to calling party.

#### OPERATOR AT RECEIVING STATION.

When called, operator to answer by giving name of station only, and to record name and station of calling party; also name and address of party called. On com-

pletion of conversation both operators to record the following information on their respective tickets:

Time Conversation commenced,  
Time conversation was completed,  
Amount of tariff,  
Amount of messenger fee, if any,

And if charges are reversed, tickets to be stamped "Reversed." Operators to immediately compare tickets on completion of call.

#### HANDLING OF FRANKED BUSINESS.

Operators to make a ticket for all messages sent and received; no ticket to marked "Deadhead."

All business subject to frank to be accounted for and reported in the regular manner as if paid tolls, and an adjustment of free business to be made between connecting companies in their general settlements.

#### TOLL ACCOUNTING.

We recommend the following general plan for accounting toll business:

All sent and received tickets to be grouped according to the station with which business has been transacted, one group for each station, and the summaries entered daily on a toll ledger prepared for that purpose. The information to be recorded as follows:

Amount of tolls sent paid,  
Amount of tolls sent collect,  
Amount of messenger fees collected,  
Total number of messages received,  
Amount of tolls received paid,  
Amount of tolls received collect,  
Messenger fees paid.

At the close of the month the footings on daily toll ledger to be grouped on to a monthly check report, showing the totals of business between reporting station and each station to which it sends business and from which it receives business. This report to be used as a basis in settlement of business between connecting companies.

#### DIVISION OF TARIFF BETWEEN A GROUP OF COMPANIES AND A TOLL LINE.

We recommend the following plan for adjusting division of revenue between a group of companies operating in a limited district, each connected with another, and one of which connects with a toll line and the connecting line:

For division of revenue treat the group of connecting companies as a toll line company, allowing the grouped lines air-line mileage from various originating points to the point where its line meets those of the toll line company, and allowing toll line company its mileage on the same basis, the toll line company to settle with the line with which it immediately connects, and this line (one of the group) dividing the net revenue which it receives from settlement with main toll line among the other lines comprising the group in proportion to the mileage the line has in.

We recommend the formation of local associations by short line companies connecting and operating in a limited district, in which case the association may be treated as a toll line company in making settlement with other toll line companies with which it connects.

In the division of tariff between two groups of short line companies, the same general plan to apply, each group being considered as a toll line company.



## FORMS FOR ACCOUNTING.

We recommend the adoption by the association of uniform toll tickets, daily toll ledgers, monthly check reports and subscribers' toll bills.

## TICKETS.

For recording sent messages we recommend the adoption of a white ticket, approximately 3x4 inches, with space for telephone number of calling party, date, calling party's name, calling party's address, name of party called, address of party called, time conversation commenced, time completed, total minutes used, operator's number, amount of toll, amount of messenger, total charge for call, ticket to be printed "Sent."

For recording received business use pink ticket printed "Received," otherwise same as sent ticket.

## DAILY TOLL LEDGERS.

Daily ledgers of one hundred pages, alternate sheets to be perforated, size about 8x10 inches, ruled in columns as follows:

Offices,  
Number of messages sent,  
Overtime,  
Tolls sent paid,  
Tolls sent collect,  
Messenger fees collected,  
Number of messages received,  
Overtime,  
Tolls received paid,  
Tolls received collect,  
Messenger fees paid.

On head of each page should appear name of originating station and station from which business has been received, or to which business has been sent. A separate page in daily toll ledger to be used for each station with which reporting station does business, pages to have thirty-one (31) lines, to enable reporting station to record on one sheet a full month's business between two stations.

## MONTHLY REPORT BLANKS.

This report to contain a summary of a month's business of station, single sheets about 18-11½ inches, to be headed as follows:

"Check report of.....office, month of.....," otherwise monthly check report to be ruled the same as daily toll ledger. This report to contain a summary of daily toll ledger sheets.

## METHODS OF DETERMINING BALANCES DUE IN GENERAL SETTLEMENT.

We recommend the universal adoption of the following plain in arriving at settlements between exchanges and toll line and between toll line companies, company originating business to be charged with the following items:

Tolls sent paid,  
Tolls received collect,  
Messenger fees collected, ..... ..

and to be given credit for the following items:

Messenger fees paid,  
Omission,  
Mileage, if any (as shown by mileage settlement).

## SPECIAL COMMITTEE.

We recommend the appointment of a special committee, consisting of three, one of whom shall be a chairman, to whom all differences of opinion between connecting companies, relative to division of tariff, mileage allowances, etc., may be referred. This committee to act in an advisory capacity only.

SAM B. RAWSON,  
THADDEUS S. LANE,  
EDWARD DAVIS,  
*Special Committee.*

[Above report was adopted at last meeting of the New York Association. The discussion of it in convention was interesting, but space forbids its reproduction here. We may, however, take up this debate in a future issue and present the points made.]

## Independent Clearing House for Iowa

GEO. T. HEWES

While local conditions are factors to be considered in the successful prosecution of any particular line of business, I shall confine my remarks to the general toll question, or rather a toll line system which covers the State of Iowa, which may or may not, apply to similar systems in other states but generally may be applied to all western states where the local exchanges are in a large measure dependent upon the farming communities which surround them. The telephonic communication between villages, towns and cities has reached a point in the development of the business when it is not only local, but far reaching, and inter-communication between different states over the lines of various different Independent telephone companies makes it imperative that a universal understanding should be had of the basic principles involved in the promulgating, building and operation of toll lines. I am to deal more particularly upon the subject of the operation of toll line companies, as the operation may apply to the ultimate establishment of a checking or clearing house. Where the "proceeds from toll charges may be divided" equitably, without particular reference to the advan-

tage of preventing the expenditure of vast sums of money in paralleling Independent toll lines already established. Not only shall we consider the toll line as a great earning power, but particularly as a safeguard to our exchange interests. The toll line system of a company is governed by laws as immutable as the laws of nature and in principle may be compared with springs, brooks and rivers, where an unrestricted flow must be maintained or congestion will be followed by disaster. A congested part in a toll line system may be compared to the stoppage of the flow of water in a water works system resulting in unsatisfactory service. The toll line plant of any company in its general character is quite similar and is controlled by conditions governing the exchange itself.

## LOCAL SYSTEM.

1. Sub-exchanges.
2. Central or general office.
3. Exchange.
4. Trunking system con-

ducting the other three.

#### TOLL LINE SYSTEM.

1. Local exchange system.
2. Toll center for entire exchange.
3. Toll territory.
4. Lines connecting toll centers.

Most of the telephone companies in Iowa have a more or less well developed toll line plant upon which conclusions looking to the future extensions may be based. It is only during recent years that this has been the case. The extent to which the public will avail itself of a proposed extension of a toll line system is no longer wholly problematical.

The result of the development of toll lines in this territory by the several companies, if systematically observed, according to some universal method, will enable us to arrive at the amount of receipts per unit of population. We will find that an increase of business results principally from the following causes:

## Out Business Check CLASS A

CALLING STATION  
CHECK No.

STATION CALLED.  
CHECK No.

\_\_\_\_\_ ?  
\_\_\_\_\_

Patent Applied For. Hewes System.

Circuit.

No. .... Route. .... Date. .... 190. ....

From ..... Tel. No. ....

At .....

To ..... Tel. No. ....

At .....

Time.	A. M.	Day.	Night.
-------	-------	------	--------

Finished	P. M.	.....	.....
----------	-------	-------	-------

Time.	A. M.	Toll	.....
-------	-------	------	-------

Commenced	P. M.	Mess'g'r	.....
-----------	-------	----------	-------

Minutes used	Total	.....
--------------	-------	-------

Tolls sent, paid or collect. ....

Charged to Cash .....

Appointment .....

Remarks .....

Operator .....

This slip must be sent to General Office whether used, mutilated or defaced.

**NEW STATE TELEPHONE CO.**

Manufactured by THE CARTER-CRUME Co., Limited, Niagara Falls, N. Y.

First. Improved service changing from grounded lines to metallic circuits.

Second. The building of toll lines to new places.

Third. The increase in the number of subscribers at the various exchanges, or the establishment of new exchanges.

Fourth. Improved operative methods, the latter shall be the object of this article.

An analysis of the toll records of several companies (Bell) and the determination of the earnings per unit of population has enabled me to determine the extent to which expenditures for the building up of the toll line system can be safely made. The general average of earnings per caput in all of the companies has increased in the last ten years from twenty to fifty cents. In 1903 the lowest average per caput in any company was twenty-four cents, and the highest about one dollar. Except in territories showing the very lowest average we should not hesitate to make fifty cents per caput the basis for extensions to new points, and for the territory of all companies which show average earnings above the general average we should apply the general average of their particular territory. Experience has shown them that in order to meet the depreciation and maintenance charges in toll lines the receipts should amount to at least 20 per cent of the toll line cost. They do not hesitate to recommend the construction of extensions to a toll line system whenever the prospective earnings will amount to 20 per cent of the estimated cost of the extension.

## In Business Check SIoux CITY

CALLING STATION  
CHECK No.

STATION CALLED.  
CHECK No.

\_\_\_\_\_ ?  
\_\_\_\_\_

Patent Applied For. Hewes System.

Circuit.

No. .... Route. .... Date. .... 190. ....

From ..... Tel. No. ....

At .....

To ..... Tel. No. ....

At .....

Time.	A. M.	Day.	Night.
-------	-------	------	--------

Finished	P. M.	.....	.....
----------	-------	-------	-------

Time.	A. M.	Toll	.....
-------	-------	------	-------

Commenced	P. M.	Mess'g'r	.....
-----------	-------	----------	-------

Minutes used	Total	.....
--------------	-------	-------

Tolls rec'd, paid or collect. ....

Charged to Cash .....

Appointment .....

Remarks .....

Operator .....

This slip must be sent to General Office whether used, mutilated or defaced.

**NEW STATE TELEPHONE CO.**

Manufactured by THE CARTER-CRUME Co., Limited, Niagara Falls, N. Y.

You will pardon my reference to Bell methods, but in the absence of data at our command we Iowa Independents must recognize facts pertaining to the business from whatever source they may come, and pave the way for the tabulation of the necessary data which will enable us to act intelligently.

As an example consider two towns, each with a population of 1,000, and located twenty miles distant from each

other. The cost of the line to connect these towns will be, say \$4,000. The anticipated earning per caput is 40c, this gives a gross earning of \$800, or 20 per cent of the cost of the line. If these towns were forty miles apart, instead of twenty miles, and the cost \$8,000 instead of \$4,000, the gross earning would be only ten per cent of the cost. Such a line might clearly be a bad investment unless the toll line company could rent pin space to farmer's companies at a price which would not only encourage the farmer but furnish additional telephone subscribers who would increase toll earnings.

From the toll company's standpoint I maintain that an exchange company can better afford to furnish switching facilities for farmers at 50 cents per month, \$6.00 per year, to farmer's lines not exceeding ten on each metallic circuit, owned and maintained by farmers, rather than to undertake to furnish telephone service at \$18.00 per year, furnishing all equipment, building and maintaining the lines. We will average two subscribers per mile. A toll line twenty miles long will produce 40 or more farmers who can be persuaded to build their own lines and pay the exchange \$6.00 per year or \$60.00 per circuit and the toll line company 10 cents per contact per pole per year. This will contribute \$160.00 towards paying depreciation and maintenance, based upon forty poles per mile. The Bell Company loses out on this proposition on account of

### **RULES, Governing the use and application**

o this system of toll accounting.

1. Calling station will give station called. The number of his or her "OUT" check and ask operator for his or her number on "IN" check, and note same on blank space on "OUT" check before transacting any further business.

2. Station called on learning the serial number on the "OUT" check of station calling will record same on blank space on his or her "IN" check before transacting any further business.

These numbered toll tickets are charged against you and each one must be returned to General Office.

They are to be used in their successive order.

## **NEW STATE TELEPHONE CO.**

**General Office, Sioux City, Iowa**

the antipathy the Iowa farmer has for them, the Iowa farmer being a factor which the Bell Company has ignored.

The toll earnings per unit of population should be made the factor in determining the advisability of the construction or extension of toll lines as well as the basis for all computation regarding the toll earning capacity in any locality instead of the amount of earning per subscriber, for the reason that the percentage of subscribers to population is such a variable quantity.

As an example, there is a town where the exchange subscribers development is nine per cent, the toll earnings \$5.00 per subscriber and the earnings per unit of population 70c. In the second place, where the number of subscribers is but five, the toll earnings \$88.00 per subscriber, while the earnings per caput is only 42c.

In order that the executive officers of a company may keep in close touch with the toll line earnings of an exchange within its territory it is essential that a statement of the following should be prepared at regular intervals:

1. Total population of the territory.
2. A list of all the places in the territory that are connected to the toll line system.
3. Population of each town connected.
4. Number of subscribers in each exchange.
5. The number of public stations in each place.
6. The amount of out tolls.
7. The gross tolls per caput for each place.
8. A list of all places of thirty or more not yet connected to the system.

The organization of a toll checking system is now contemplated and the foregoing remarks will, in a measure, impress you as being fundamental and of great importance. No hard and fast rule can be laid down to cover all conditions, as I have said, at the outset, that local conditions govern local requirements. Therefore, in a state like ours with its length of \_\_\_\_\_ Miles and breadth of \_\_\_\_\_ miles, we should consider, possibly, several center checking stations which we shall not attempt to locate until such a time as we have secured the necessary data, which we will secure along the outline previously mentioned. We must necessarily, however, locate one checking or clearing house at a point where the greatest number of telephones per mile of circuit is available and your Toll Tariff Committee of the Iowa State Association has wisely selected Des Moines.

It may interest you to know that out of a total of 25,000 telephone messages (estimate of C. E. Tart, general manager, Grand Rapids, Michigan, Telephone Company)

Eighty-two per cent were 10, 15 and 20c charges,

Nine per cent 25c charges,

Nine per cent were 30c charges.

Throughout a radius of thirty-five to forty miles, 72 per cent were transmitted between the hours of 8 a. m. and 5 p. m. These facts demonstrate that local conditions are factors to be considered and suggests, also, that your investment is practically idle fifteen hours out of the twenty-four.

The fixed charges against your plant are constant throughout the twenty-four hours. Means should be devised whereby the lines can be used more generally throughout the other fifteen hours. The income will then be "all velvet."

### **TREND OF TRAFFIC.**

The first step in a toll traffic study is to determine the trend of the traffic from the toll stations to the adjoining exchanges.

### **EXCHANGE DISTRICTS.**

The trend of traffic having been determined it is possible to define the exchange districts.

### **CIRCUIT ARRANGEMENTS.**

In order to determine the necessary circuit arrangements between the various toll centers as arranged with their exchange districts, it is necessary to analyze the traffic within the toll system.

It shall be the object of the clearing house to compile

all the necessary data concerning the entire toll territory. Following in general the methods of the National Inter-State Telephone Association in compiling maps, showing in detail the toll lines as they exist and each extension as it is constructed from time to time, a clearing house in each state will greatly facilitate the works of the Inter-State Telephone Association. To arrange traffic, to compile tariff books for each district, to route traffic so that an equal division of tolls may be enjoyed between two points, should there be two competing Independent toll lines, opening up an undeveloped territory, to make non-paying lines pay, and last, but not least, to check all messages and pro rate the earnings.

This system has been in use for years at Waterloo, Iowa, and is strongly endorsed by Mr. Shoemaker, general manager of the United States Telephone Company. The New State Telephone Company (Toll Line Co.), headquarters at Sioux City, Iowa (I have a few sample tickets printed for them for each of the persons present, for your inspection), have recently placed an order for one million tickets which will be used throughout their system. I would recommend that the clearing house association proceed to adopt standard forms of accounting which will embrace substantially the methods as set forth,

particularly the forms of checks for toll messages, which, so far as I can learn, is the only system which can be universally adopted and give the best possible results.

Who can look back and review the experience of the early Independents and remember how the Bell Telephone Company ridiculed us, knowing the difficulties we would be compelled to encounter in establishing Independent exchanges from the data which they had compiled from year to year, should appreciate the importance of inaugurating some systematic method of securing the necessary data concerning toll line facts so that we may progress more rapidly and more successfully within the next few years than we have in the past. The fact that the Bell Company is concentrating its energies and expects to control the toll line business of this state, being willing to withdraw from the local exchange business where arrangements can be made with the Independents, should encourage us to familiarize ourselves more on the subject of toll lines so that the next ten years will see us in the same relation toward the Bell toll lines as we now bear comparing our local exchange interests with theirs.

(Read before the convention of the Southwestern Iowa Telephone Association, at Council Bluffs, October 28, 1905.)

## Telephones in Europe

The last stragglers returning from the summer season on the continent are proclaiming louder than ever, this year, their joy at getting home again.

"It may be the land of the 'big stick' and the almighty dollar," said one globe-trotter, when he stepped from ship to shore; 'but, after all, the 'big stick' is emblematic of the American spirit of getting something done, and the 'almighty dollar' can buy some of the real comforts of life on this side of the ocean. On the other side they can only guess at what either means.'

"Two things specially call forth the obliquity of the homegoers—foreign railroads and foreign telephones. In railway travel we seem to have the advantage not only in the matter of comfort, in which no comparison whatever is to be made, but in speed, in regularity and in transportation charges. The telegraph has been developed in Europe to a point not yet attempted in this country, but in England and on the continent the telegraph is practically the only means of quick communication. Things that are done there by telegraph are done here much more easily, quickly and economically by telephone. The European has no comprehension of what constitutes telephone service as we of the United States know it from daily experience."

"A couple of months ago the director of the technical department of the government telephone and telegraph lines of Hungary and one of his prominent fellow-countrymen from Budapest were touring the United States to study our methods. They visited New York, San Francisco, Chicago and other cities, and before they went away

"The city of Budapest has 8,000 subscribers to its telephone service. We have a population of 800,000, so you can readily see that the telephones are not so extensively used as in this country. We have the latest American improvements in the telephone, and we procure all our supplies from America. We have 25,000 miles of

toll lines, and we can telephone from Budapest to Berlin, a distance of 650 miles."

"An American city half the size of Budapest would have at least 20,000 telephone subscribers. Boston, with only two-thirds the population of the Hungarian capital, has five times the number of telephones and New York, with five times the population, has about twenty-eight times as many. The greatest user of this invention on the continent is Sweden, yet the whole of Sweden has only about half as many subscribers as the single company which serves northern New England. The city of London, with its 6,000,000 people, has 93,598 telephones, while this city, with its 4,000,000, has 220,155.

"The reason for this disparity is that foreigners know neither how to run a telephone system nor how to use one. It is not that they are unable to get as good equipment, for the most progressive among them use American instruments and switchboards. But American resourcefulness and American progressiveness have made the difference between the possibilities that have been worked out of the telephone here and in the other hemisphere.

"The European regards the telephone as a luxury, the American as a necessity. The foreign telephone company operates apparently on the principle that as long as you have a wire with a telephone at each end, it makes no difference whether you can hear anything over the circuit or even whether it is a quicker means of communication than the railway. On the other hand, the American system has been built up by the constant making of improvements and the expenditure of millions of dollars to bring them into use.

"An American just back from Scotland said the other day:

"When I was in Glasgow I asked a business friend if I might use his telephone to call up a man in Edinburgh with whom I wanted to make an appointment.

"'Certainly you may,' he said, 'if you have the time. If you are in a hurry you had better run up to Edinburg yourself on the train. It only takes an hour, and it will surely take you longer than that to get a telephone call through.'

"The long distance service,\* which is yearly becoming a more important factor in American business, is something the foreigner cannot comprehend at all. Two or three hundred miles is what he calls a long distance; if you tell him people talk every day over the thousand miles of wire between New York and Chicago, or the 1,600 miles between Boston and Omaha, he sets you down in the same class with the man who has been spinning yarns of the rate at which the cornstalks grow in Iowa, or the size of the barns the Kansas farmers use. The longest connection possible to the telephone user in Germany, where telephony is particularly well developed for the continent, is between Paris and Berlin, 741 miles.

"When the proposition to establish long distance service between Paris and Rome came up a couple of years ago, it raised a discussion that amused American engineers. It is 907 miles from the French capital to Italy's ancient city, while, as the Bell line goes, it is more than 100 miles further from New York to Chicago. The New York-Chicago telephone service had been in constant and very successful operation for ten years when the French and Italian authorities began to put their heads together; yet to the Europeans the undertaking of extending the 'zone of communication,' which already included circuits from Lyons to Turin, and from Turin to Rome, seemed full of the most puzzling problems.

"The Paris-Rome telephone line,' said M. Crescitz, chief of the telephone bureau of the French government, 'will be the longest international telephone system in the world. It will, therefore, require an exceedingly powerful current to make the messages distinctly audible; those we are now obtaining are far from that. The current is far too feeble.

"How shall we remedy this difficulty? That is a thing which only a technical commission can determine"—thereby illustrating the beauties of government management, for the momentous question which M. Crescitz declared required a technical commission for its decision was as to the size of copper wire necessary to be used, and that had all been figured out by the Bell engineers years before. Furthermore, even with the minute current used in telephoning, the perfection of the American system is such that conversations over lines more than 1,000 miles long are distinctly heard. The current employed is almost too slight to be measured; a comparison often made to show its character is that the electrical energy which lights a sixteen candle-power incandescent lamp is 5,000,000 times as great as the electrical energy in a telephone receiver at the end of a thousand mile line.

"The French, however, of whom we would expect quite different things, are very backward in telephony. The service in Paris has been so bad that subscribers have formed leagues to compel a reformation of the telephone girl and her employer, even when the employer is the government. The Paris correspondents of London papers declare that, though pretty well hardened to poor service by their experiences at home, even the slow and indifferent operators of London are preferable to the intractable and impertinent young women who worry the Parisians who are 'paying a hundred dollars a year for the privilege of being flaunted by them.'

"When other topics have been temporarily exhausted,

their telephone service affords a never-failing subject for complaint to Londoners. They have the postoffice department lines as well as those of the national company. Londoners are pointing out to one another that subscribers themselves have no idea of how to use the telephone. One restricting influence is, of course, the 'dull conservatism of many British business men and officials,' to use the words of a progressive and disgusted Briton.

"Perhaps the most Americanized telephone user in Great Britain is King Edward. The employment of Dr. Bell's invention always seems to strike him as natural and proper. Not long ago a party of tourists from 'the States' appeared at Buckingham Palace, armed with a letter from the secretary of our London Embassy, and wanted to inspect the royal residence. They were allowed to go no further than the stables, because the Lord Chamberlain, who must issue their permit, was out of town. Nobody knew where he could be reached, but one of the party suggested that the Lord Chamberlain's permit might be dispensed with by obtaining the consent of the King himself.

"When the palace official to whom this proposition was made recovered from the collapse into which it threw him, he solemnly assured the visitors that this was impossible, since His Majesty was attending the races at Newmarket. One of the Americans, not in the least 'phased,' inquired whether His Majesty could not be communicated with by telephone. The official recovered from this second shock enough to admit that such a thing might be possible; and, after a good deal of palavering, the young man in charge of the palace switchboard was persuaded to 'risk it.'

"The King's reply was almost immediate. If the Americans were properly authenticated, they were, 'by His Majesty's commands,' to be allowed to go over the whole palace without being subjected to irritating scrutiny.

"Pope Pius, in so many ways one of the most progressive of Europeans, employs the telephone constantly. No doubt it does much to relieve the seclusion which must often be trying to a man of his naturally virile activity of body and mind. When Cardinal Sarto, Patriarch of Venice, went to attend the conclave in Rome, after Pope Leo's death, two years ago, he bade his sisters good-by for three weeks. He was elected Pope within a fortnight, and has never seen Venice since; but his sisters, with whom he lived before he entered the Vatican, have moved their home to the Eternal City, taking a dwelling so near their brother that every day he may come out upon a balcony that is within sight of their windows and greet them from a distance.

"The installation of a telephone in the Vatican is characteristic of the 'dignified modernity' of His Holiness. Not only does he employ it in the direction of the multitude of vast interests in his charge, but he utilizes it largely in his more personal life, so to speak. Every day, regularly, he converses with his sisters over the wire, and many times his greetings have been conveyed to more distant friends and former parishioners in the same way."

The above article appeared under a New York date line in recent issue of a Southern newspaper. It is represented as being of general interest to the telephone field.

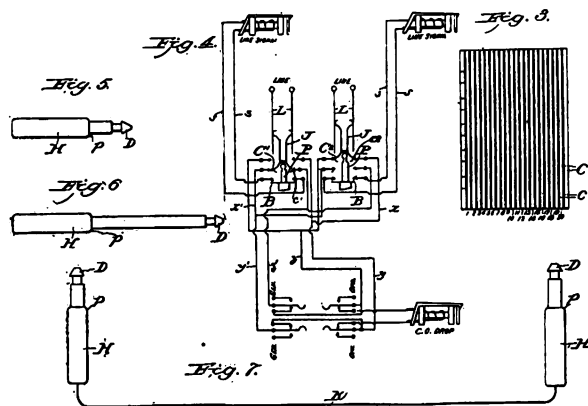
Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y., report having closed contracts for switchboards for the following places: Tremonton, Utah; Columbus, Ohio; Robinson, Ill.; Lakewood, Ill.; Chillicothe, Mo.; Garland, Utah.



# Recent Telephone Patents

Joseph L. Wright, of Cleveland, Ohio, Telephone Switchboard, patent No. 798,123.

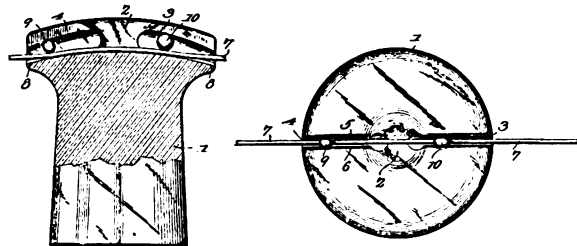
This invention relates to telephone switchboards, and has for a particular object the construction of a switchboard wherein the use of conductors connecting the plugs is avoided, and is characterized particularly by a construction wherein the connections instead of terminating in plugs and cords terminate in rows of connecting strips made up in pairs. Jacks and plugs of novel construction are used with these



strips. The jacks are sliding jacks, comprising two pieces of spring-metal insulated from each other and having contact at each end with the strips and the bus-bars on each side of the lines. These jacks are moved by plugs, which vary in length according to the number of connecting lines and comprise pairs connected with a string to show which two parties are connected. The pairs of plugs move the sliding line-jacks, the first of the pairs to the first and second connecting strips, the second to the third and fourth connecting strips, and so on up to the last pair of plugs, which move the jack to the last pair of connecting strips. The plugs have heads on the inner end, which catch behind springs on the outer ends of the jacks to restore them to normal position when the plugs are withdrawn.

William R. Twiggs, of Sandusky, Ohio, Insulator, patent No. 798,235.

This invention relates to insulators. One object of the invention is to improve the construction of such de-

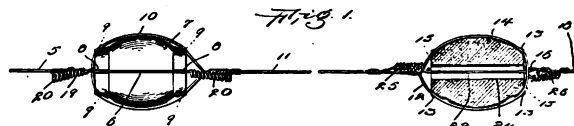


vices by rendering them capable of holding the line-wire securely with the use of tie-wires or similar fastening devices. Other objects of the invention are to simplify and cheapen the construction of insulators.

With these objects in view the invention resides in an insulator formed with a central depression from which lead off in opposite directions a plurality of downwardly-inclined slots which taper toward their outer ends and are adapted to receive the line-wire, said wire being held in the slots by balls inserted through the central depression and engaging said line-wire.

Benjamin P. Bartlett, of Norway, Kans., Anti-hummer for Telephone Wires, patent No. 798,252.

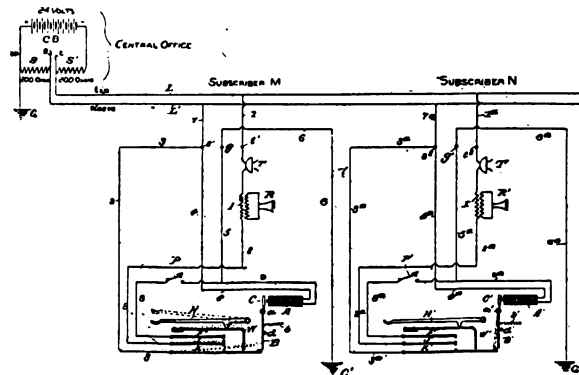
This invention relates to devices for preventing the humming sound common in telephone wires, the ob-



ject of the invention being to provide a device which will be cheap and efficient and which may be easily and quickly put in place.

Mark P. Boone, of Peru, Ind., Common Battery Lock-out Telephone, patent No. 798,561.

This invention is in the nature of a lock-out device designed for common battery party-line telephones, whereby all parties are locked out except those properly using the line, so that the conversation may not



be overheard by others on the line. It is applicable to any common battery system which has one side of the battery grounded and has impedance coils interposed between the opposite poles of such battery and the two line-wires at all times.

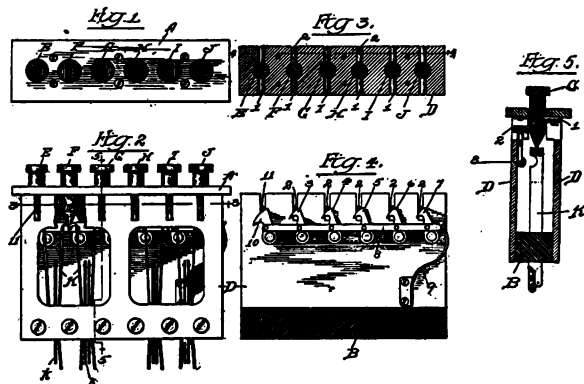
Michael Setter, of Chicago, Ill., assignor to American Electric Company, of Chicago, Ill., a corporation, Telephone Switch, patent No. 799,019.

This invention relates to electric switches in general but more particularly to switches adapted for use in electrical signaling systems, and especially to a form of key-switch for use in telephone systems—as, for example, party-line systems.

Generally stated, the object of the invention is to provide a simple, improved, and comparatively inexpensive switch involving in its construction a plurality of keys and switch-springs for controlling a number

of different circuits, the arrangement being such that any particular circuit may be closed for any desired purpose by depressing the key allotted to such cir-

tain details and features of improvement tending to increase the general efficiency and serviceability of a telephone switch device of this character.

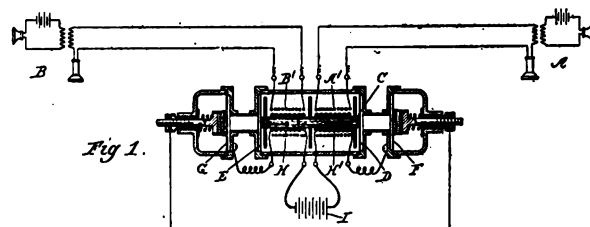


cuit, and involving also an additional key which may be depressed for the purpose of restoring any of the circuit-keys, the arrangement also being such that no circuit-key can be operated while another circuit-key is depressed without causing the depressed key to return to its normal position, or, in other words, without opening the circuit already closed.

It is also an object of the invention to provide cer-

David H. Wilson, of Chicago, Ill., assignor to George W. Kretzinger, of Chicago, Ill., Telephone Repeater, patent No. 798,720.

This invention relates to telephone repeaters, and has for its object to provide a new and improved device of this construction.



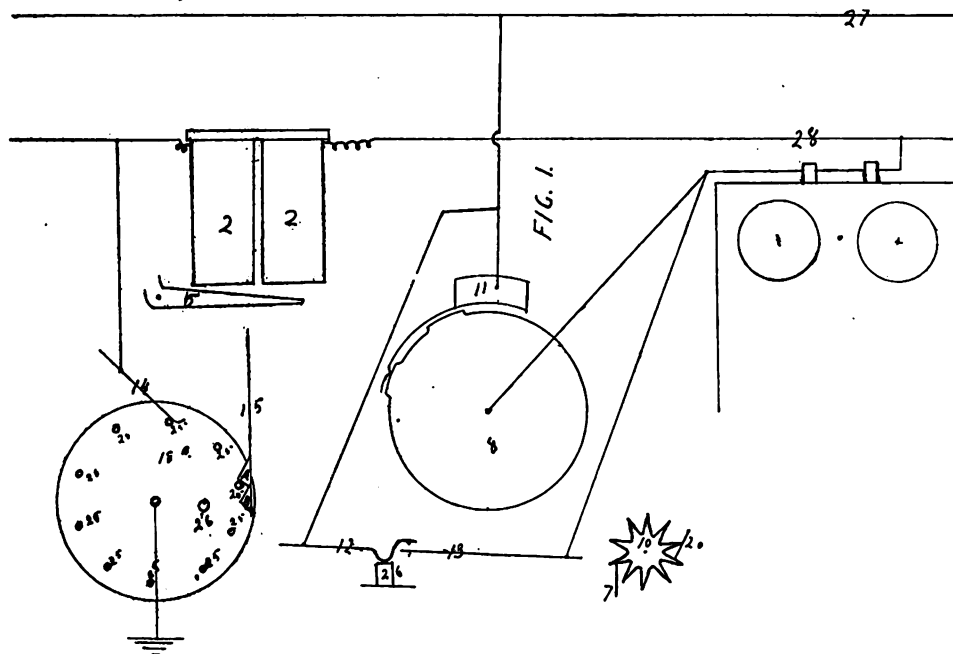
It comprises a core having two coils thereon, a receiver associated with said core, a transmitter associated with said receiver, a coil on said core in circuit with said transmitter, and a source of electric supply in circuit with the coil.

## New Selective Signaling System for Rural Lines

The new selective system for use on rural lines has been invented by W. H. Harden, which is claimed to be a great improvement on anything else, because it does away with the necessity of having the signals made from

wire. Fig. 10 shows the ratchet wheel and the manner that springs 21 and 7 act on it.

Sheet 2 shows point or base with dial pointer, etc. Fig. 3 back side of base with all parts in place.



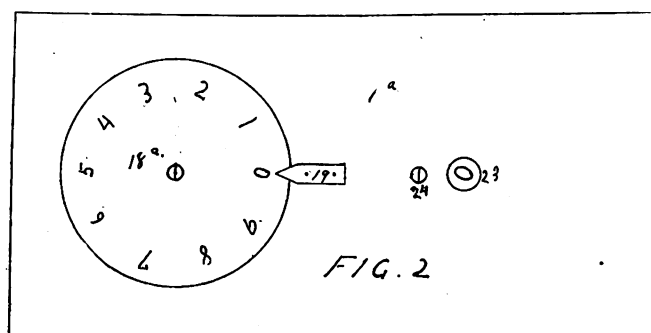
a central point. Anybody at any telephone may easily make the desired connections and ring any other telephone or all the telephones on the line.

Sheet No. 1 shows a diagram of the wiring with respect to the line, appliance, telephone and ground or third

Sheet No. 3, Fig. 4, lengthwise cross section. Fig. 5, cross section through dial. Fig. 6, diagram of line and battery wiring.

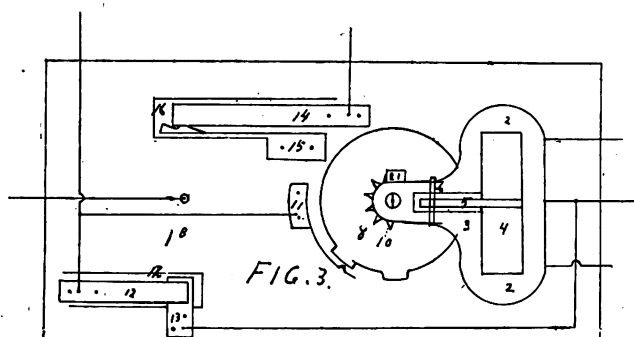
When the appliance is wired in as shown on sheet 1, the operation is as follows:

The subscriber turns his dial 18a, to the number that he wants, pointer 19 showing him the proper position. The number shown in hole 23, sheet 2, also changes so as to correspond with the number shown by the pointer (thus all telephones show the number called), and then

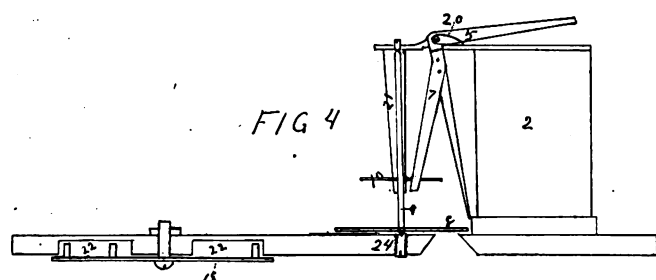


rings in the ordinary way, or if he does not desire a private conversation, the line in normal position may be used as a non-selective party line.

As the dial turns the studs 25 are revolved past spring 14 (see diagram, sheet 1), thus making connection between the return wire of the telephone line and the ground or a third wire may be used, this causes the batteries



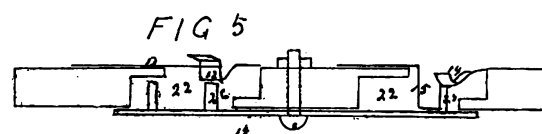
placed in each end of the line, as shown in diagram 6, sheet 3, to act, they having remained neutral on account of their peculiar wiring and position. This energizes the magnets, placed in the return wire, and they pull down the armature 5, spring 7, causing ratchet wheel 10, and its accompanying shaft 9, and contact wheel 8, to



revolve. When the studs 25 have passed out of contact with spring 14 spring 20 causes armature 5 to return to its normal position with its lower projection against the base of the magnet. This lower extension has prevented the ratchet wheel from turning too far by catching in its cogs as it turned, and spring 21 has prevented its turning backward as spring 7 returned to its place.

The points on spring 15 catch the studs 25 on the dial 18 and prevent double pulsation or turning backward.

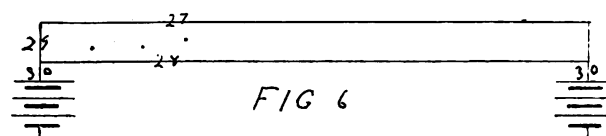
The number shown by the pointer 19 and the hole 23 is always the same at the calling station, and always the same at all stations at No. 23, thus showing who is called or if the line is open.



As the dial passes each number the action is the same except in this way. As the dial is turned from 0 the insulated stud 26 passes from under the spring 12 and it springs down and connects with spring 13 and remains in contact until the dial is turned completely around, and by this means connects the telephone with the line.

Wheel 8, as shown, is for station 2. For No. 1 it is to have a double cog, No. 3 like 2 only farther apart, and so on all around to the last number, which would have a double cog again.

In normal position the 0 cog (as shown in diagram), makes connection with spring 11, and as the dial is turned



the cogs on the contact wheel 8 come in contact with spring 11 successively and thus successively connecting the telephones.

When the dial has completed its revolution the wheel 8 has also completed its revolution and both again show 0, as wheel 8 is numbered on its face to correspond with the dial.

This is an absolutely secret talking and ringing system, and not being an absolute lockout would give very much better service in the country as certain parties could not hold the line indefinitely.

It will be seen, by reference to the diagram on sheet 1, that the derangement of one station or burning of the stopping magnet coils when the line is in normal position, will not hinder the use of the line as a non-selective party line.

### Self-Acting 'Phone Directory.

The newest idea for telephone users is based upon the automatic annunciator idea. It consists of a circular plate on the desk, which has upon its outer circumference spaces for from fifteen to fifty names and telephone numbers. To notify the operator to call a desired number it is not necessary to shout the name through the desk telephone and then wait while the number it looked up. The indicator on the dial is moved to the desired number, a bell is rung, and the office central operator finds the name and number indicated upon a duplicate dial.

Another and similar device for keeping telephone numbers where they are handy is intended where but a single instrument is in use. The transmitter is surrounded by a collar formed of flanges which are lettered alphabetically. On each flange there is room for a dozen names and the numbers are always handy to the 'phone.

# Talks and Queries

## Pole Changer Problem

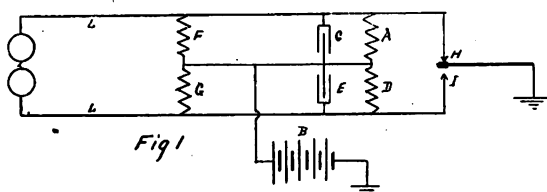


FIG. 1

EDITOR SOUND WAVES:—The above is a sketch of an ordinary pole changer with our small automatic switchboard. By experiment, I find that by disconnecting the coils A and D, each of which is a 500 ohm coil, I do not get as loud a ring at the 'phone and the clapper has more of a tendency to jump than when they are connected across the condensers as shown. Please give me the action of the condensers and coils and explain in your question and answer department of SOUND WAVES.—E. L. F.

In the diagram, A, D, F and G are coils, each of which is wound to 500 ohms. When the pendulum makes the contact with H, current from the battery B flows through coils F and A, the combined resistance of which is 250 ohms, through the contact H to the ground and back to the battery again. Current also passes through the coils D and G out over the line L, through the bell and thence to the contact H, and ground. When the contact H is broken there is a kick from the coils F and A which passes out over the line A in the same direction as the direct current from the battery. When the pendulum swings to the contact I the current is again thrown on, but in the reverse direction. When you took the coils A and D away you doubled the resistance through which the current passed and of course you would not get as strong a ring. When the current from the battery is broken the current, but for the condensers, would rise too rapidly and cause induction on the lines not being rung. The condensers prevent the sudden increase of current and thus keep out the induction.

## Running Farmer Lines Through Cable

EDITOR SOUND WAVES:—I have a large number of farmer lines ranging from five to fifteen miles in length. I have been warned against handling them through a paper cable on account of lightning and induction. Some parts of the system must have cable as soon as possible and I want to carry all wires through the cable and use outside boxes for the reception of the open wires.

My idea is to bring all toll and farmer lines into a repeating coil at the cable box farthest from the office. Can this be arranged so as to ring through this coil and then use each pair in the cable to help do away with the induction and not split the pair as many do, and ground one end of each pair? If, in your opinion, this is a feasible idea, kindly refer me to some firm who make such coils.—A. B.

In regard to the farmer lines that you have coming into your exchange, you should have no hesitation in running them through the cable. Of course they should be metallic in the cable, but we do not think that it will be necessary to have repeating coils unless the insertion of the coils will prevent noise on a connection. Even then we think that the coil in the switchboard will be

more advisable. The coil should be in the cord circuit, and should be used only when such lines are connected with long metallic circuit lines. The lightning will cause more trouble with the repeating coils if placed on the line than it can possibly cause to the cable. The writer well remembers a case where a repeating coil was placed in a toll line about two miles outside of a town, to prevent trouble from a street railway line. Every thunder storm meant a trip to the coil in order to put a new one in position. After a time he removed the coil and grounded one side of the line directly and there was no further trouble. The service was just as good as before.

Run your line right through the cable and ground the one side of the pair at the cable pole. Be sure and have a perfect ground. Put carbon block arrestors at the cable pole for each line and the chances are that you will have no trouble from lightning. If you used coils on the line you would have trouble in ringing.

## Adjustment of Pole Changer

EDITOR SOUND WAVES:—I have a pole changer and have it connected to the switchboard metallic, while most of my lines are on a common return that is grounded at the central office. Some of the lines are grounded direct. I can listen at any of the subscribers stations and can hear the vibrator on the pole changer buzzing; I can also hear the operator ringing other parties.—G. W. S.

Answer—It may be that the adjustment of the pole changer is not good. If the contacts are not made just right, there will be the trouble which you explain. All pole changers are subject to induction troubles, when used on grounded or common return systems. In running the pole changer wires into the switchboard, you should have them as far as possible from the line cables. The two leads should be twisted together and should be well insulated. It may be that the ringing keys on the board are not in good condition and that there is considerable direct leakage to the wires of the system.

If everything is in good condition and the trouble comes from the design of the pole changer, bridge a condenser of four M. F. across the two power leads. Then connect in series with each lead, a coil which will act as a retardation. A single coil from a series ringer movement will do. These coils measure forty ohms each. The coils will cut down the strength of the current somewhat, and you may not be able to ring the heavily loaded lines. For explanation of the way to arrange the condenser and coils see the article on "Coils" by P. K. Higgins (Figure 4) in this number. We think that the trouble is most apt to be in the insulation of your switchboard.

## Job Lot of Questions

EDITOR SOUND WAVES:—With a grounded circuit, how far would it be necessary to keep from a telegraph



line running parallel to it in order to be free from an induction or disturbance?

Can just as good service be given with a grounded circuit party line as with a metallic?

If we wished to put in a good line to connect with a metallic system, would you advise us to use the metallic or would we be troubled by a grounded circuit?

Could we have two grounded circuits on one row of poles without cross talk, or any other trouble?

How long will No. 12 B. B. galvanized iron wire last?

Is the iron wire better than steel?

On a grounded line fourteen miles long of No. 12 B. B. wire, how many five bar 1,600 ohm telephones can we give good service to, if the telephones are first class.—J. W. G.

On a grounded circuit you should at least have the full width of the road between the telegraph line and yours. Even then you will hear the sound of the instruments on the telegraph line if you run parallel for any distance. We have known of a case where the telephone line ran parallel or nearly so for forty miles. The average distance apart was about two hundred yards. The sound from the telegraph line was plainly heard at all times, but not sufficient to interfere with the telephone service.

Whether a grounded line will give as good service as a metallic line depends upon what you consider good service. As far as talking is concerned, it will give much better service. The metallic line is not disturbed by weather conditions or by adjacent power lines if built properly. It would be impossible to give service over a grounded line of much length.

For short rural lines that are not bothered by parallel lines the grounded circuit is about as good as the metallic, and it can be heavier loaded before there will be any interference to the ringing.

By all means build your line metallic circuit if you expect to connect with a long distance line of the same kind. You can talk all right between a grounded and a metallic line if you connect them through a repeating coil.

Two grounded circuits on the same lead of poles will cross talk in spite of anything that you can do.

The length of life of No. 12 B. B. iron wire depends upon the conditions surrounding it. In the country where there are no soft coal fumes and nothing but the pure air, it should last fifteen or twenty years.

The iron wire is better than steel because it is a better conductor of electricity.

On a line fourteen miles long where the best five bar sixteen hundred ohm instruments are used you should be able to ring thirty-five telephones—the line to be perfectly constructed and a grounded circuit using No. 12 B. B. galvanized iron. Whether you could give good service on such a line depends upon what your patrons called good service. You could talk all right if you ever got a chance at the line, but the chances are that there would always be a large waiting list.

### Grounding of Position Pole

Editor SOUND WAVES:—Will you please explain in the next issue of Sound Waves why the positive pole of the battery in a common battery system is always grounded? Why the positive rather than the negative? Why ground at all?

Also can you give the diagram of the coil windings and the connections of the coils used in a phantom circuit?—R. P.

If the negative side were grounded there would be trouble from electrolysis where ever there was a leak to ground. Whenever there is a leak in the case when the positive is grounded, the current passes from the ground to the conductor and hence it will not be affected. If the current was to pass from the conductor to the ground the wire would sooner or later be eaten in two.

With the battery grounded, there is less danger to the system in case of a cross from a high tension line. It can get no farther than the battery when it is carried to the ground. If there were no ground, the current might be carried to some other lines and cause a great deal of damage to property. It is frequently necessary to ground the battery in order to be able to signal, either the line signals or the trunk lines may require a ground.

Figure 2 shows the diagram of the arrangement for a phantom circuit. The diagram shows but one end of the circuit. The other end is just the same. LL are the two

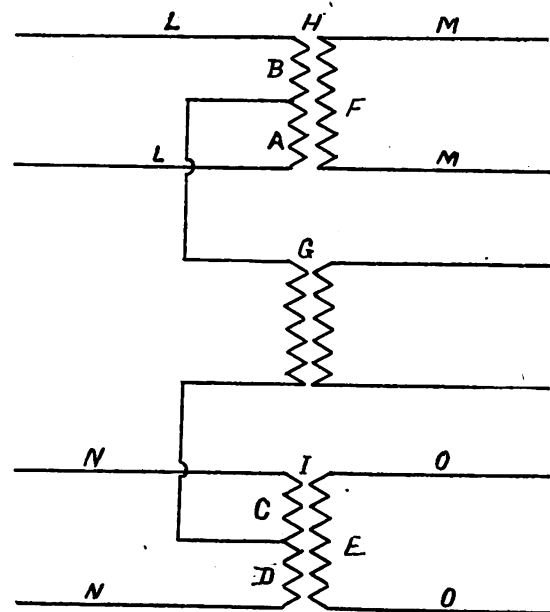


FIG. 2.

sides of one metallic circuit, while NN are the two sides of the other. These two lines or circuits end in repeating coils as shown. All speech is then repeated to the lines MM and OO upon which there are two telephones.

One of the windings of the repeating coil H and I is in two exactly equal parts. From the centre of this winding in each coil a tap is taken to the third coil G, the secondary of which is in the circuit of a third telephone. This third telephone is in the phantom circuit. The talking current from this telephone passes through the coil G and then passes to the two coils H and I. The current splits in the two repeating coils and half goes over each side of each of the metallic circuits. The windings A and B of coil H are of exactly the same resistance, they have the same number of turns and are similarly placed with respect to the core. In order to get the best results, this winding should be with two parallel wires. If the two windings are wound at the same time and parallel, they must be of the same resistance and have the same number of turns.

# ELECTRICAL SHOW

Chicago, January 15th-27th, 1906

At the Coliseum

## SPECIAL TELEPHONE DAYS

January 22-23-24

---

From present indications and direct advices there will be more Independent telephone people attend this Show than any two telephone conventions put together, and many that never attended any.

The majority of Independents are also interested in other lines of business—Electrical and otherwise; therefore, this show will attract those that never attend conventions of one line.

The leading Independent Telephone manufacturers of the United States will be represented, and will exhibit all their latest improved apparatus and on a magnificent scale never before attempted.

The largest supply houses, cable companies, wire companies, conduit companies, battery manufacturers; in fact, EVERYTHING pertaining to the telephone business will be displayed on a broad scale and without regard for expense.

Prominent Independent telephone men will be present and will help the vast number of Independents to show to the general public that Independent Telephony is THE most prominent and important part of the whole Electrical field.

**ELECTRICAL TRADES EXPOSITION CO.**

464 Monadnock Bldg., Chicago.

N. B.—Please advise us what day you intend to arrive so that arrangements can be made for your entertainment.

# Notes of the Trade

## Stromberg-Carlson Transmitter No. 7-a

This is a new type of telephone transmitter just presented by the Stromberg-Carlson Telephone Manufacturing Company. It is designed to be used with equal success over long and short distances. Its construction is such, the company states, that it will give soft and pleasing transmission over short distances and still makes possible communication over the longest lines with the least possible exertion on the part of the speaker.

In describing the principle of this new transmitter, the following interesting points are given:

The volume of transmission depends upon the change of distance between the electrodes brought about by the vibration of the diaphragm. In all of the forms of transmitters now in use only one of the electrodes is vibrated with the diaphragm,

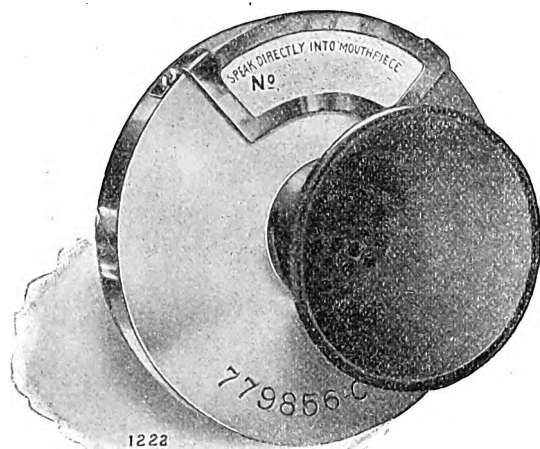


Fig. 2

and in the better forms this one electrode takes up the same amplitude of vibration as the central point of the diaphragm, which is the maximum point of movement.

In the new transmitter both of the electrodes are attached to the central point of the diaphragm, producing a variation of the distance between the electrodes of twice the amplitude of vibration of the central point of the main diaphragm.

It is evident that a transmitter constructed along these lines will produce a greater volume of transmission than if only one of the electrodes is movable. This transmitter is given such an adjustment that under ordinary tones of voice the volume is

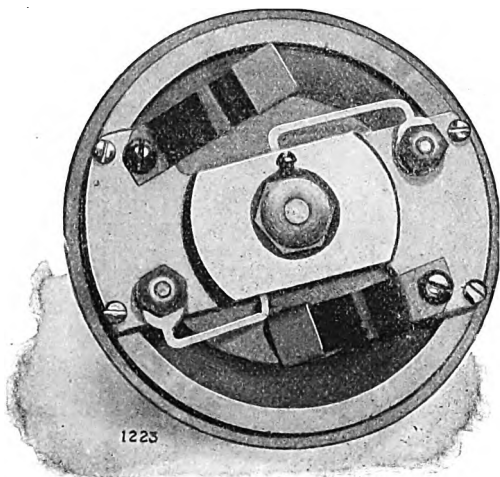


Fig. 3

even less loud than some of the forms of sensitive transmitters now being manufactured, but as the voice is raised the volume of transmission from the instrument is multiplied twofold, so

that the transmission when talking in a loud tone of voice has much more volume than from any other type. The advantage of this is readily seen.

The mechanical construction of the transmitter follows out the practice that has been found to be the most satisfactory for high-class apparatus; that is, the use of highly-polished carbon electrodes and irregularly formed carbon granules enclosed in a practically moisture-proof case, using no absorbent material whatever, so that the transmitter when once assembled should be entirely free from any bad effects due to atmospheric changes, and should be equally as efficient in any climate. The trans-

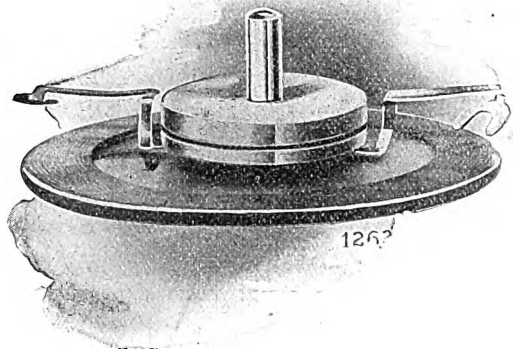


Fig. 4

mitter is made more durable, particularly in damp climates, by the use of an auxiliary moisture-proof diaphragm over the main diaphragm, thus preventing any chemical action of the main diaphragm, due to moisture or alkali from the breath.

The illustrations 5, 6 and 7 clearly show the construction of the instrument. It will be observed that what corresponds to the front electrode in the ordinary transmitter, is divided into two halves, each forming a terminal. The back disc with highly polished carbon is used only as an electrical connection between the two halves of the transmitter. Fig. 4 shows the diaphragm with the connectors and cup attached. Fig. 5 shows the front view of the cup with the diaphragm removed, and the method of fastening the connectors to the electrodes. Fig. 6 shows the cup dismounted with the granular carbon removed; "a" shows the

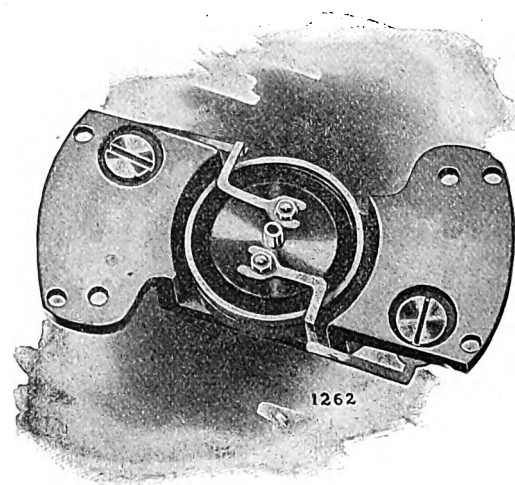


Fig. 5

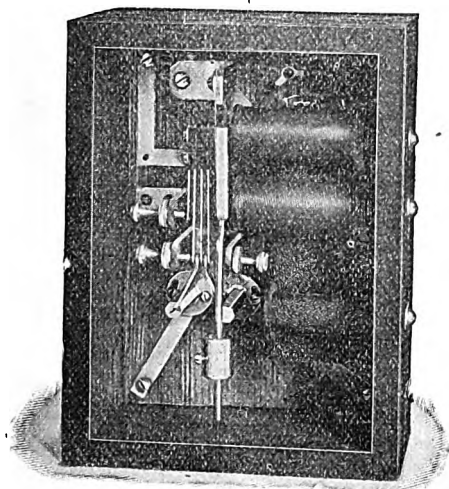
front of the cup with the electrodes fastened to the auxiliary mica diaphragm; "b" shows the cup with the back carbon disc. Fig. 7 illustrates the parts of the cup; "c" is the back of neutral carbon disc; "d," the cup; "e," the separating ring; "f," the electrodes and mica diaphragm; "g," the clamping ring.

Continued on page xx.

# STANDARD SPECIALTIES

## THE STANDARD POLE CHANGER

- ❑ Is simple, as shown by the illustration.
- ❑ Economical and convenient as it takes but one battery to operate it.
- ❑ Efficient, as it works perfectly on all alternating or direct current ringing.
- ❑ Present price, \$15.00.



❑ The entire mechanism is built on the inside of a highly finished quarter-sawed oak case with the binding posts and switchboard on the outside. To observe the interior simply turn it over; there is no glass to remove or get broken; will work perfectly in all positions. Dimensions are 6x8x4 inches; weighs 3½ pounds.

## THE STANDARD DUPLEX SET

- ❑ Makes two talking and ringing circuits from one bridging metallic line.
- ❑ Use both simultaneously without interference.
- ❑ Durable, as there are no movable parts to wear.
- ❑ Many exchanges now have a large number in use.
- ❑ Price complete \$15.00 a set.

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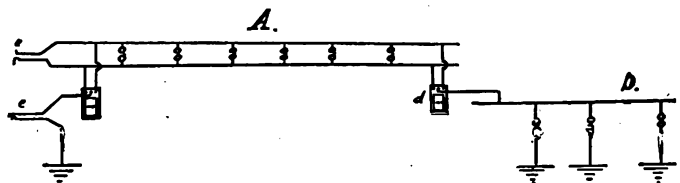
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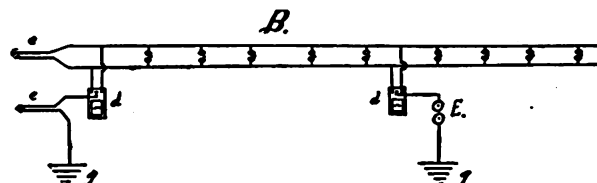
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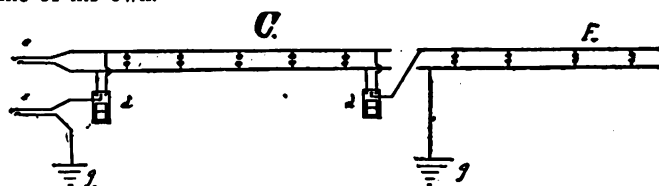
❑ The following illustrates some of its uses.



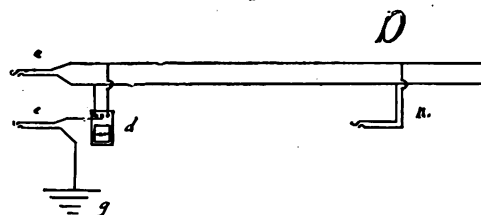
*Fig. A.* An extension or side bridging line can be connected to a metallic circuit at any convenient place so as to render service absolutely independent of the service on the Metallic Line running out from your exchange say ten miles, loaded to its capacity, and there are other parties beyond this line who would like telephone service, but you can not afford to run a line all the way out from the Central office to accommodate them; simply connect the Duplex Set to the outer end of the line, run a single wire to the new subscribers and operate the extension line the same as though the line ran all the way to the switch-board.



*Fig. B.* If you have a subscriber anywhere on a Metallic line that would be willing to pay a little extra for private service, get a Standard Duplex set and operate his telephone from a separate drop on the switchboard the same as though he had a line of his own.



*Fig. C.* If you have a heavily loaded Metallic Line, it would be well to divide it at some convenient place and use it as two separate lines without cross-talk from one to the other when both are being used at the same time, and without extra expense except the small cost of the Duplex Set.



*Fig. D.* Perhaps you may have a Metallic Toll line, say forty miles long, over which only one conversation can be carried at a time. By using the Standard Duplex Set, two conversations can be carried on over this line at the same time without either interfering with the other.



The carbon electrodes used in this transmitter are manufactured by the Stromberg-Carlson Co., of a special grade of very dense carbon properly treated, so that it is of exceedingly low resistance, and securely soldered to the connecting discs without the use of any salts or acid. The surfaces of the carbon buttons are very highly polished, which lessens the danger of the transmitter packing, and prevents arcing. The company manufactures its own granular carbon, selecting the raw material with great care in preparing the product, so as to produce the proper resistance to give the best results, and to cleanse the carbon and have it of such density that it will be entirely free from dust, which has a tendency to film the electrodes and seri-

mitter is accurately measured for resistance and given a practical test on both short and long lines in comparison with other instruments, thus assuring that each transmitter has been properly assembled and received an accurate adjustment.

A card holder of neat design, held in place by two of the transmitter mounting screws is furnished with each instrument. It is provided with a transparent celluloid disc and white paper back on which may be printed the telephone number.

In conclusion, attention is called to the fact that no metal whatever is used in the construction of this transmitter excepting brass, thus insuring sufficient weight and freedom from warping, which is more than liable to occur if any composition parts are

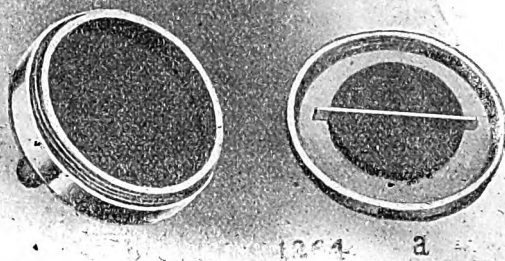


Fig. 6

ously impair the transmission. The diaphragm is made of extra hard aluminum, and is carefully straightened in a powerful machine of the company's design. It is protected by a celluloid disc. The auxiliary diaphragm for sealing the carbon cup is made of the best selected India mica carefully gauged to thickness, so that each transmitter will be alike, and is securely held in place by the clamping ring. The rubber band for insulating the diaphragm against vibration from the retaining case, is made of a very high grade of rubber, in order to insure its remaining soft and pliable and to prevent any tarnishing of the inside of the retaining case. The bridge is made from heavy solid brass, the binding posts being insulated therefrom with mica, so that no part of the retaining case of the transmitter, or any exposed por-

used, as it is evident that the slightest movement on the part of the framework would throw the transmitter completely out of adjustment and render it practically worthless. No exposed part of the transmitter is connected with the telephone circuit—a principle that is carried out in all of our telephone apparatus, thus insuring the subscriber freedom from any disagreeable shocks or injury.

The Marion (Ind.) News-Tribune in a recent number contained a cartoon representing a business man holding a telephone receiver to his ear. The sweat was pouring from his face. The cartoon is inscribed: "What is the man thinking? Is the man crazy? No, the man is not crazy. He is only trying to get central to answer. It shows what kind of telephone service Marion has now." The Marion Chronicle also printed a cartoon the part of which represented a young man going into a telephone booth over the protest of his family. The second scene represents him emerging from the booth a veritable Rip Van Winkle. The little daughter has grown up to become a young lady and the wife has become an old lady. There is a look of triumph on his face when he says, "I got 'em all right." Sometime ago the Central Union (Bell) Company bought the controlling interest in the United Telephone Company of Marion. The result seems to have been the usual one where the Bell acquires a plant and especially where it succeeds in ridding itself of opposition—poor service. O. L. Barger and associates are receiving much encouragement for the inauguration of a new automatic telephone plant in Marion.

The Central Illinois Telephone Association has been called to meet in the parlors of the Fey Hotel, at Peoria, Ill., on January 5 and 6. Telephone operators and manufacturers please note.

The Wonewoc Telephone Company of Wonewoc, Wis., has been sold to J. G. Hollingsworth, of South Dakota. The manager, M. E. Hutchins, will remain with the new company until spring.

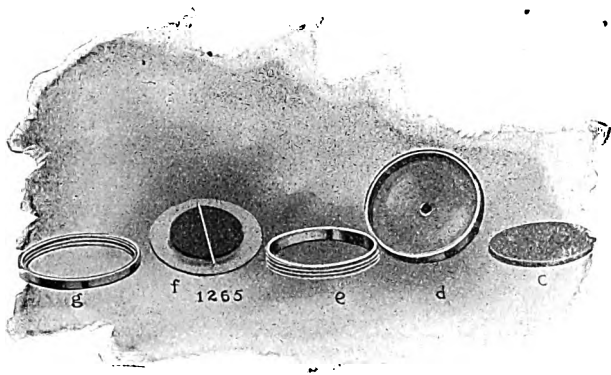


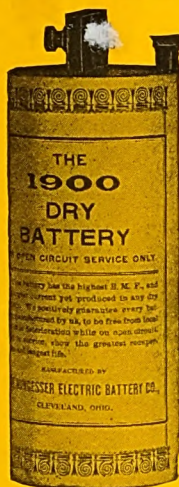
Fig. 7

tion, is connected with the circuit. The front is made from heavy brass of simple design, and accurately turned. The back is made of heavy sheet brass.

Each transmitter bears a serial number followed either by the letter "C" or the letter "L." "C" is for Central Energy transmitters, and "L" for Local Battery transmitters. Each trans-

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The "SPECIAL" No. 225, actual size  $2\frac{1}{8} \times 1\frac{1}{4}$  in. terminals included, is easily installed in any bridging magneto box and recommended for use on phones already in operation.

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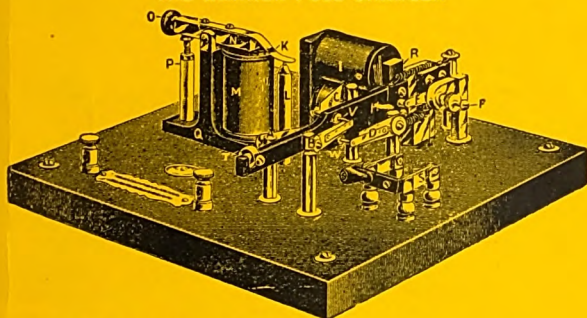
WRITE FOR CATALOGUE No. 11, which tells all about our products.

**JULIUS ANDRAE & SONS CO.**

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THE WARNER POLE CHANGER



Patented Nov. 5, 1901. Other patents pending.

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☞ The U. S. Circuit Court sustains the Validity of the Warner Electric Co. Pole Changer Patents, and issues an Injunction against the Manufacture, Sale and Use of the Illinois Pole Changer.

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**4**

# NOTICE

**4**

¶ On Sept. 5, 1905, the United States Patent Office issued to Oscar M. Leich the dominating patent on Selective Four Party Telephone Ringing Systems covering all present practical forms of high and low frequency systems, together with all so-called harmonic or different frequency arrangements.

¶ This Patent was filed in Patent Office Feb. 9, 1900, more than two years before the so-called "Harmonic" patent application; the so-called Harmonic patent is only a detail and not a fundamental patent.

¶ The evasion of infringement of our patent is not accomplished by the adjusting (tuning) of the ringer by the application of weights, springs, etc.

¶ Our Patent No. 799010 covers all reactive means such as condensers of varied capacity, impedance coils, etc., for operating Selective ringers whether adjusted (tuned) or not, and no merely adjusted (tuned) ringer can be operated in practice without employing some kind of reactive means such as above described, and the mere addition of weights, adjusted (tuned) springs or the like, does not evade the claims of our broad patent.

¶ We can furnish the Leich four-party different frequency system with or without using the ground for return circuit.

¶ We are sole licensees under said patent.

**4****AMERICAN ELECTRIC TELEPHONE CO.****State and 64th Sts. CHICAGO, ILL.****4**



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# SOUND WAVES

VOL. XI.  
No. 3

AN ADVOCATE OF  
INDEPENDENT TELEPHONY

FEBRUARY  
1906

Published Monthly by THE THOMAS H. WILSON CO., Logansport, Indiana

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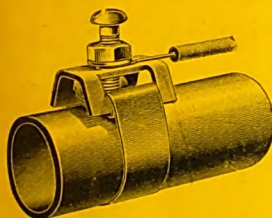


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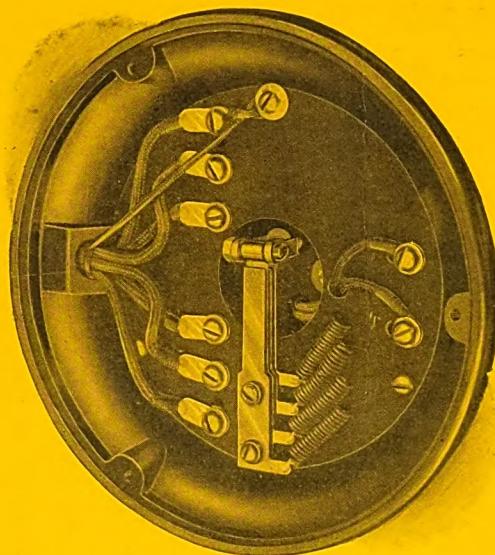
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# MONARCH APPARATUS

## *The* DESK STAND



The desk stand illustrated above is simple and durable. That it is neat and attractive in appearance can be seen at a glance.

The base is cast iron, protected on the bottom by a covering of felt and on the top by a nickel plated brass shield.

All connections are made within the base on a rubber plate. The plates are interchangeable, so local battery desk sets can be changed to common battery by merely changing the connection plates and the transmitters.

No electrical connections are made with the frame of the stand. The transmitter cord has two conductors which terminate on the plate in the base.

The pedestal tube is steel with a rubber enamel finish which will not crack or wear rough.

This stand as well as all combinations of ringing apparatus are described in the new telephone catalogue. A copy will be sent upon request.

# MONARCH TELEPHONE MFG. CO.

14-16 South Clinton Street, CHICAGO, ILL.

# SOUND WAVES

A Monthly Magazine Devoted to the Interests of Independent Telephony

Vol. XI.

FEBRUARY, 1906

No. 3

## SOUND WAVES

PUBLISHED MONTHLY AT LOGANSPORT, IND., U. S. A. PRICE FIFTY CENTS A YEAR

Entered as second-class matter July 14, 1903, at the Post Office at Logansport, Indiana, under Act of Congress of March 3, 1879.

The Thos. H. Wilson Co., Logansport, Indiana, Proprietors and Publishers

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Telephone, Chicago Office, 2904, Illinois Telephone Co. (Automatic)

## SUBSCRIPTIONS

One Year, United States and Canada	\$ .50
One Year, Foreign Countries	1.00
Single Copies, each	.10

S. RENTELL & CO., 39 Maiden Lane, Covent Garden, London, Eng., British Representatives

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## EDITORIAL COMMENT

All communications to the editorial or advertising departments of this paper, answers to want advertisements, subscriptions, etc., should be sent to the Chicago office, addressed plainly to **SOUND WAVES, 1362 Monadnock Bldg., Chicago, Ill.** Subscribers and others will confer a favor and facilitate the work of this paper by complying with the above request. Technical and news contributions will receive prompt attention and are respectfully solicited.

## STANDARDIZATION OF TELEPHONE APPARATUS.

There seems to be a strong movement toward the standardization of all kinds of apparatus in the telephone line. The chances are that those who are longing for this ultimate goal, do not realize what is necessary before this can be accomplished.

It is true that every manufacturer is hoping for the day when he may lay off his tool making department. New apparatus is extremely expensive for him and if it were possible for him to get his product into such shape that he would not have to make any more advance, he not only could make more profit but he could afford to sell cheaper.

Every manufacturer is apt to congratulate himself several times each year that at least he has brought his goods to the ultimate standard. But alas he soon discovers some improvement that has been made by his competitor and he must therefore get busy again and produce something as good or better.

The Bell Company has been in good position to standardize their apparatus, because they control the majority of the companies who use their goods. All they have to do is to dictate and the companies follow their instructions. In their case a change of apparatus is an expensive move. At one time all their receivers were of the old single pole type and the transmitters were Blakes. There were at least two millions of each which had to be replaced by the bipolar receiver and the solid back transmitter. It is reasonable to suppose that a transmitter and receiver would cost one dollar. Therefore the total expense of the change would be two million dollars. The Bell Company is using a receiver with exposed binding posts. No doubt it would like to have the concealed binding posts, but if the change were made, it would cost them millions to do it. It can be seen, therefore, that the manufacturer would be much pleased to have all his products stay uniform. On the same principle, the exchange operator would also like to have all the instruments the same and all the parts interchangeable. By having the apparatus all alike there is much less expense in mak-



ing repairs and there need be no large stock of parts kept on hand. In addition the workmen in the exchange will be more familiar with the apparatus and can make repairs more rapidly and with more intelligence.

Suppose though an exchange were using the same apparatus that was being used ten years ago. How much business would it be doing today? The whole trouble from the standardization of apparatus is that progress is stopped. As long as there is a possible improvement in telephone goods there can be no complete standardizing that is justifiable. The only reason that the Bell Company made any change from their old styles, was because competition made them do so. If they had not, they would have been hopelessly distanced by their competitors. Even now the Independent progress has been so rapid that there are a number of companies making better apparatus than the Bell ever thought of producing. Why? The Independent companies have had to make progress in order to get the business. Under sharp competition every endeavor is made to get out goods that can be made better and at the same time cheaper than others.

There is another point that must be considered, which keeps standardization from being accomplished, and that is the specifications of the engineer of the telephone exchange. It is natural for an engineer to wish for something that is the child of his own brain. He therefore lays down rules for the guidance of the factory and these rules multiply the variety. One manufacturer is making over six hundred styles of telephones because of the demand of the customer for something different. These telephones are not different in the essentials and all requirements may be met by a dozen different styles. As long as the maker cannot control the user he has to do as the user says, even though the cost is greater.

Combination on the part of the telephone users would, without a doubt, reduce the number of types and so far as the styles are concerned it might be a good thing, but there would be a very effectual check to progress.

No doubt, in the future some day there will be a standardization of apparatus, but that day is far away. When all the possible progress has been made there will be an approach to the goal, but nobody can tell how far it is possible to make improvements and consequently there can be no definite prediction as to the date of general standardization.

While it is desirable in some particulars so far as the style and arrangement of apparatus is concerned, to have a standard established, it certainly is not desirable to curtail progress by a general standardization of design of the apparatus. Nobody can tell the enormous loss to the public caused by the purchasing and suppression of improvements to telephone apparatus by the Bell monopoly. Very likely the progress of telephony was set back ten years by these tactics.

It would seem therefore that the best interest of the telephone user is served by the unlimited improvement of his apparatus, and the only way to secure unhampered improvement is to continue the sharp competition in invention.

The offices of the Chicago Writing Machine Co. are now at Galesburg, Ill., where they have been some thirty days in moving. They moved their factory there early in the spring.

## ECONOMY, REAL AND SUPERFICIAL.

Many Independent telephone plants are the result of dissatisfaction with existing conditions, and, with reference to the smaller ones especially, it has been noted that sufficient time and consideration are often denied them by the people in charge of the work. This, to be sure, is inevitable, where inexperienced persons have formed a company and made a canvass of the situation. Not being properly equipped by education, it often happens that work is begun before it should be, and when it comes to the ordering of supplies from the manufacturers, wrong or insufficient specifications are given. Companies have been known to fail of their object and to be put back years in their development through the sheer incapacity of the management and the lack of a suitable technical man to say what to do and when to do it. To be ignorant of the details and requirements of telephone work is not discreditable except to the one who poses as being well informed in such matters; to be well informed requires technical education and experience. Therefore the doctor, the lawyer and the grocer who form an Independent company should frankly confess themselves at sea, with regard to all matters of practical telephone work, and at once cast about them to secure at least the temporary services of a capable consulting engineer.

Some means must be provided for taking care of such conditions. There is but one source from whence disinterested and authoritative suggestions may come. We refer to the National Inter-State Telephone Association, which should be in a position to recommend to companies needing his services a competent, qualified consulting engineer. The duties of such a position might require the time of two or more good men, who should be retained by the association and paid a suitable compensation, so that their services could be made available to new companies at little more than the cost of railroad fare and regular membership fees in the National Association.

Such experts would be a good investment for all the Independent companies composing the whole field—that is to say, the field could well afford to submit to a slight additional tax in order to attach a few engineers to the regular staff of the National Association for the purpose we have outlined above.

To make each Independent plant strong and well constructed would mean success, immediate and permanent, for the whole Independent movement. The adversary depends for its arguments on the occasional weaknesses in our ranks, and it is among the weak where he makes his inroads. Like an old gray wolf, he works silently in among the herd and singles out here and there some member who is too weak to make effective resistance. So long as he does his work with swiftness and silence, he may remain unnoticed by the stronger members of the herd; but let him make a false play and all his sureness of foot and eye are needed to save him from destruction. The opponent of the Independent movement has somewhat of the dexterity of the coyote and the strength of the wolf, which makes him a very dangerous adversary indeed. When the Independents have awakened from their bovine slumbers, they will certainly have none of him, but will so strengthen the weak and build up their power and vigilance that the old gray wolf will go a-begging for a bone.

These experts should also be available for the use of any Independent company at a nominal fee to pass upon their plant as to its condition, future requirements, etc.

If we begin right, and keep right, there is no better investment than Independent telephone securities. Where an exchange is not able to hire expert help, there the Inter-State Association should step in with its assistance. It will be money well spent.

The experts retained by the association should be men of integrity and standing, beyond the influence of any set of men, and the association should give such assurances as will guarantee their entire fairness, so that no manufacturer of worthy goods should fear their judgment.

Some source of expert help and advice must be available or many small Independent exchanges will go the way others have gone, to the loss of Independent telephony as a whole. Let the National Inter-State take up the matter now before private enterprise shall accept the chance for possible profit.

### SUCCESSFUL SOLICITING.

BY F. B. CHESTER.

Ideas and methods of soliciting subscriptions for telephone service differ materially and each one has its merit and demerit.

Of course in localities where we (the Independents) are all, the soliciting problem is of no moment, but we have localities where our competitors make the soliciting a serious problem and one worthy of every telephone man's consideration.

There is a location where the Bell has an equal number of subscribers and their toll facilities seem to be more perfect.

It is not an unusual occurrence to hear one of our men say: "Of course the Bell has us skinned on Long Distance"—and nothing is more incorrect or wrong for them to say, as we can look on all sides now and find our service where there is no Bell, and in very few places can we find it vice versa. The latter places we all know well, would be equipped with our service were we not Independent.

The large cities we try to enter are ruled by a gang and we can get no franchise, but the day is at hand when the people are speaking for themselves and the old monopolistic gang must step aside and give "Right" a chance and back "Wrong" up and keep him there.

When a man becomes acquainted with the fact that Bell is on account of long distance, ask him at once to what places he refers, and if a non-station of yours (which he will very likely name) have him show you how often he talks, and if he won't do so, make it your business to find out, by getting a clerk or other employee to get it for you, or make it your business to be in his office when he has just paid his bill, so you can see what it is. I have not failed yet to swing a man on this count, although it has taken months to do it on some.

When a man becomes acquainted with the fact that all your convictions are entirely true, he is going to give you consideration and aid, and you can never get another to do better work for you in the future than the man who was hard to land. In no event land a man by trickery or deceit, as it not only kills individual respect but loses money for your company and must end in failure.

The proper way to solicit is to take every objection offered by your prospective subscriber, make a note of it (if unable to properly answer it at the time) and when alone find an excellent answer or explanation or in fact

several, and make it your business to remember it for a future case of like nature. Don't tell all you know and then lay down when you get winded. When you approach your man, meet him as your equal, and in no event try to raise yourself above or let him think you are below him.

You are working for the further development of one of the greatest things in the world, and must let your man know it, but do so by asking questions and answering questions. Questions are the finest salesmen the world knows, so why not use them?

Use the best rule ever put before a man to insure a bold, always prudent," and you will gain when you least know it. Meet your man with a "How-do-you-do, I want to tell you something" and he shuts up, out of courtesy if nothing more, and all you get is a "Good day, I'll think it over." He has had no chance, and your very best points are lost to him.

Do not in any event knock on your competitor, and don't join in a knock. Simply turn off a knock by saying, "Of course our ways of doing business are not alike and that possibly accounts for your opinion of them," and then put forth your business as before stated, by questions and answers. Remember, "Comparisons are Odious," and so do not make them unless forced to do so.

Remember it is a "Survival of the fittest" from start to finish, and never fear your competitor unless his service is better than yours, and if it is better, stop soliciting and put your service in shape so it is better than his; Don't say "Can't," there is no such word. Just go ahead and do it without delay, and don't stop even after you have done it, but keep on.

The only time we can "Lie down," is when we no longer exist in this world and then it is a mystery whether we can or not.

If any Independent exchange has trouble in this line I will be only too glad to give them such advice as my experience and knowledge will afford, through the agency of our SOUND WAVES, which we must give credit for most excellent work in our behalf.

NOTE: Mr. Chester suggests that most of the trouble seems to be in getting the business, and recommends that others take up the subject and send us their views, and tell of their methods.—Ed.]

### Milwaukee Conditions.

Richard Valentine, president of the Independent Telephone Association of Wisconsin, in a recent interview, said:

"Milwaukee is losing thousands of dollars' worth of business each year because of the fact that it has not an Independent telephone exchange. Thousands of our subscribers in northern Wisconsin do their business at Minneapolis and St. Paul because they cannot reach your city through an Independent system. Milwaukee is the only city of its size in the United States that has not an Independent company. Such cities as Minneapolis and St. Paul are provided with large Independent concerns. Because of this fact the subscribers in Milwaukee are paying much more for their 'phones than they ought to. All the pressure that can be brought to play will be used in getting an Independent company for Milwaukee."

SOUND WAVE want ads pull. You try them—We will prove it.



## MUNICIPAL OWNERSHIP IN FORT WILLIAM AND PORT ARTHUR, CANADA.

The telephone franchises of the two towns have excited public interest to a very large degree, principally because of the splendid fight which, with assistance from the Union of Canadian Municipalities, the two towns have been able to put up against the greed of monopoly and the oppression of an exclusive agreement between the Bell Company and C. P. R., which shuts out municipal 'phones from the C. P. R. premises. The telephone monopoly of Canada had an exchange in the two towns during the last eighteen years. But the plant was so antiquated, that had it been used by Noah to locate the dove during his wanderings when the flood of water was abating on the face of the earth, the poor bird might never have got back to the ark. Not only was the system antiquated but the service was bad and the means of redress so tardy, that the citizens, in the fall of 1902, installed a central energy system, with a free exchange between the two towns. This franchise, at the low rate of \$1.00 domestic, and \$2.00 commercial, has met all charges of interest, sinking fund, maintenance, depreciation, and at the end of its second year gives a balance gain of \$554.25, in Fort William, after wiping out a deficit in 1903, of \$4,576.42. In Port Arthur, the balance gain at the end of its second year was \$1,050.00 after meeting all charges. By the end of this year there will be about 1,200 telephones in service in the two towns, and the combined income will be about \$20,000.00, which will show a net balance gain of about \$2,000.00 for each town, or \$4,000.00 in all.

This year will witness rapid growth in all the franchises. The location of the G. T. P. terminals at Fort William, the development of Kakabeka water power, the large 3,000-barrel a day flouring mill of the Ogilvie Company now erecting at Fort William, the coal and ore docks and smelting works under construction at Port Arthur, together with incoming industries, will develop our municipal plants in the next five years to a very marked degree.

These franchises are very valuable, not merely in the low rates and good service, though these are of great importance; but their value is greatly enhanced, because the people not only own the franchises, but have the increment of growth, which already is more than equal in value to the municipal debt of the two towns. Public ownership calls for and is capable of developing good citizenship. Business integrity and ability are equally as necessary in this as in private ownership. I am of opinion that the franchises are best operated under a Board of Commissioners, of which the mayor is ex-officio a member. There may be five with one retiring each year. The actual work should be under the care of a first-class superintendent or manager who is responsible to the commission for successful operation. Municipal ownership has come to stay, and it is a step in the direction of the best interests of all the people. The dangers are no greater from graft and incompetence than in private ownership. There are difficulties, and one of our greatest just now is the decision of the Railway Commission, which requires us to pay the Bell Company \$5.00 annually for compensation on each paid 'phone, and gives the C. P. R. a bond for \$85,000.00 which they claim as probable loss. It may be a legal judgment but it is a most unjust and iniquitous condition, to impose on these two towns. We will never act on, or submit to it. Our

only means of redress lies in legislation. I would like this U. C. M. to take some action. Surely this great body, all united, as one person, can bring pressure to bear upon the Legislature. First, to take back from the charter of the Bell Telephone Company that special privilege of its works being considered for the general good of Canada. This clause has interfered with the rights of the people. The power that gave it, has the authority to take it back again; secondly, Parliament should declare that this exclusive agreement between the Bell Company and C. P. R., is contrary to good policy, and is a restriction to trade and commerce. This Union is strong enough to accomplish these two things, if every town and city will cast its influence in this direction. Let it be the noble aim and constant endeavor to educate the people in the great principles of co-operation for their mutual good. While doing this we shall not only benefit the entire people but elevate municipal work to a dignity and usefulness second only to the best forms of work in the Provincial and Dominion Parliaments (applause).

[The above is a portion of an address delivered by ex-Mayor Dyke, of Fort William, Ont., before the fifth annual convention of the Union of Canadian Municipalities. At the conclusion of Mr. Dyke's speech, the convention expressed its appreciation by tendering him a vote of thanks and put itself on record as opposing the exclusive agreement between the Bell Telephone Company and the Canadian Pacific Railway, whereby all telephones are excluded from the railway premises, as being contrary to good public policy and an unjust interference with the rights and principles of trade and commerce.]

### "Seeing Things" by 'Phone.

Our Bell contemporary, the *Cumberland Telephone Journal*, relates an instance of the almost human intelligence of the Gray telephone pay stations. It is understood, of course, that this story is to be taken with a small pinch of sodium chloride:

"It is well understood that by simply dropping in the proper coins these stations will notify central of the amount deposited without requiring the user to work buttons or levers. It has lately been found that they show central the different coins received, and while the latter feature has not been patented by the Gray Company it is fully claimed by two gentlemen who have had this feature demonstrated to them. It came about in this way: they went into a public pay station booth at the depot and after Mr. B—— took down the receiver and gave the operator the number required, turned to his friend with the following question. "Say, Jack, this ought to be a good place to get rid of a plugged nickel, oughtn't it?" "Sure," was the reply, whereupon central was heard to say: "Drop in five cents, please." The plugged nickel was dropped with a smile. A momentary pause, and central again repeated sweetly, "Drop in five cents, please." "I have dropped it," replied Mr. B——. "I know, but that one was plugged; now drop in a good one," replied central. A good nickel was quickly deposited in the slot and the desired party had. Now the gentlemen are willing to swear that the Gray Pay Station shows central all that occurs inside of public booths, and while they will not tell just how it happened, they are positive it shows central the coins. Had they discussed the plugged coin matter before taking down the receiver, it would have saved them not only the worry of how it is possible to see by telephone, but also the trouble they now have of carefully adjusting their neckties before they can be induced to enter a public pay station booth where there is a Gray device."

### YEAR'S DEVELOPMENT IN TELEPHONY.

One of the significantly large developments in the electrical field in 1905 was that witnessed in telephony. The growth there was probably much greater than in any other branch of electrical application. It might have seemed that the violent outburst of activity noted four or five years ago would have worn itself out or at least quieted down into sober advance, but the activity is so steadily maintained at a high rate it would appear to be normal rather than abnormal. At least there is still every sign that the industry is far from the point of saturation, and he would be a bold man who would predict just what that point is likely to be. A brilliant illustration of this growth sustained at a high rate, is furnished by the New York Telephone Company. In June, 1899, that corporation had 32,196 subscribers in the Borough of Manhattan; in May, 1905, the number was no less than 148,595. Such expansion might seem exceptional, but in the figures just issued for the five boroughs of Greater New York for January 1, we find that the telephones in service and under contract were 242,155, showing a gain for the year of 51,491. That is an increase at the rate of at least 30 per cent per annum.

We know no good reason why 30 per cent should not be applied as a rate of telephone growth all over the country, but it is certainly conservative to take 20 per cent, and even 25 might be safe. Dealing with the telephone industry as it was in 1902, it will be seen that some very striking figures emerge as to the conditions at the end of 1905. With 2,315,297 telephone stations in 1902 a steady gain of but 20 per cent gives over 4,000,000 at the end of 1905. The investment or capitalization was \$348,031,058, and would now be \$6,000,000. The gross income in 1902 was \$86,825,536 and it would now be not less than \$150,000,000. To some persons it may be incredible, but the fact is that the telephone industry has now surpassed in profit and productiveness the central station industry. That its pace will slow down somewhat, presently, like that of the lighting business, is highly probable, but as we have said there is absolutely no indication of any immediate intention on its part to do so—*Electrical World*.

### European Telephone Conditions.

The Association of Chambers of Commerce of the United Kingdom recently passed a resolution expressing the opinion "that direct and more efficient telephonic communication should be established as soon as possible between Liverpool and other great mercantile cities of Great Britain and the principal commercial centers of Europe, the exigencies of trade requiring the utmost facility." A copy of this resolution was forwarded to the English postmaster general, who holds out little hope that an extension of England's telephonic connections with the continent can be expected in the near future. The *Chamber of Commerce Journal*, in a summary of the postmaster general's report, says that he fully appreciates the importance to the mercantile community of such communication, and that the subject is one to which he has given much attention. He would be glad if it were possible to afford more extended facilities, but he fears that the difficulties in connection with long distance telephony are not fully understood.

The telephone service is unlike the telegraph service in this respect. Telephonic conversation is dependent on minute variations in a small electric current; and,

although a double copper wire line is used in all cases, the effect of outside disturbances and the attenuation of sound is very marked when the line extends over long distances. There is, therefore, a limit beyond which it is at present impossible to carry on conversation. The limit varies according to circumstances, the presence of a section of submarine cable having a considerable effect in shortening the limit. In the case of telegraphs it is possible to use more powerful electric currents and to insert relays in the circuit which have the effect of augmenting the current at regular distances; but neither of these alternatives is at present practicable to the same

Before arrangements were concluded for the use of Anglo-French and Anglo-Belgian telephone lines by subscribers outside the respective capitals, careful and prolonged experiments were made with a view to determine the maximum limits within which it was practicable to afford a reliable service between this country and France and Belgium. Since then many extensions of the service have taken place, which have been made possible chiefly through the adoption of more suitable plants on the continent; and it is now possible for communication to be obtained from Liverpool with over 100 places in France (excluding places in the immediate neighborhood of Paris) and between Liverpool and Brussels and a few other places in Belgium.

Special experiments have also been made with a view to ascertaining whether a service between Liverpool and Antwerp could not be afforded; but this was found to be impracticable. The question of telephonic communication with Holland has also been under the postmaster general's careful consideration, but he is advised by his technical staff that under present conditions it is not practicable. On the 1st of September last the services were thrown open to the subscribers of the National Telephone Company. There is, however, reason to fear that the intervention of another switching operation may in some cases impair the efficiency of the service.

The postmaster general believes that within the limits authorized an efficient service is already given by the postoffice. In the cases of complaint which have come under his notice the difficulty has generally arisen from the use of an unsuitable form of telephone at one end or the other of the line. He is always willing to investigate cases of unsatisfactory service. The postmaster general regrets that at present it does not seem possible for him to hold out the hope of any material extension of existing facilities; but further experiments will, from time to time, be made, and he will be glad if, by the advance of science and invention, he is able to meet the views expressed in the resolution of the association.—*Finance*.

Vinton A. Sears, of Boston, Mass., who some months ago resigned from the various automatic telephone companies in Massachusetts, has moved to the Sears building, Boston, where he will continue to be interested in independent telephone work and securities. He will, however, be independent of any particular system of telephony. Mr. Sears organized the Automatic Telephone companies at New Bedford and Fall River, Massachusetts, which were the first in the world to demonstrate the feasibility and practicability of the automatic or "girlless" system. Mr. Sears is the author of the well known book, "Telephone Development, Scope and Effect of Competition," the second edition of which required 5,000 copies for this country and Europe.

# THE GREAT ELECTRICAL SHOW

Less than half a century lies between the old Libby Prison of the Civil war and the Chicago Electrical Show. The Coliseum is the counterpart of the old, the home of the new. With knowledge gained from the experience of others in other electrical shows, notably in New York and Boston, the promoters of the present exposition, with characteristic Chicago energy and foresight, have left no stone unturned to put up a show which is a credit to the whole country. To accomplish this, a vast amount of labor has been performed under the able guidance of Manager Mercein and his staff of assistants. The resources of the electrical world have been ransacked to

eral Storage Battery Company, India Rubber Gutta Percha & Insulated Wire Company, Manhattan Electric Supply Company, Metropolitan Electric Supply Company, Monarch Electric & Wire Company, Miller Anchor Company, McRay Conduit Company, Nungesser Electric Battery Company, National Carbon Company, New York Insulated Wire Company, National Wire Corporation Company, Okonite Company, Ltd., Oliver Manufacturing Company, Purdue University, Phillips Insulated Wire Company, Roth Bros. & Company, John A. Roeblings' Sons Company, Rock Island Battery Company, Safety Insulated Wire Company, Telephony Publishing Com-



procure good exhibits, and it is expected that the practical and educational value of the show, as well as its commercial value to the exhibitors, will be great indeed.

The telephone trade will be represented at the show. Among those in our lines who present exhibits are the Stromberg-Carlson Telephone Company, the Swedish-American Telephone Company, Automatic Electric Company; American Electric Supply Company, American Steel & Wire Company, Ackerman & Boland Telephone Company, Armour Institute, M. B. Austin & Company, American Electric Fuse Company, J. A. Bennett, Benedict & Burnham, Chicago Solder Company, Central Electric Company, G. W. Conover & Company, Chicago Telephone Company, Frank B. Cook, Crescent Insulated Rubber Wire Company, De Veau Telephone Company, Electric Appliance Company, Electric Storage Battery Company, Federal Electric Company, Guarantee Electric Company, General Electric Company, Gen-

pany, *American Telephone Journal*, *Western Electrician*, *SOUND WAVES*, University of Wisconsin; University of Illinois, W. F. Warner Company, and others.

One of the unique exhibits to be shown will be an electric clock nearly eight feet in height which is made of 15,000 pins of a uniform size. This clock attracted much attention in the electrical department of the St. Louis world's fair. It was designed by F. G. Dickerson and will be exhibited by the Chicago Solder Company which furnished the material for cementing this mass of pins together. The largest search light in the world, also used at the St. Louis fair, will also be used from the roof of the Coliseum during the show. Inside the big building there will be 30,000 square feet of space covered with novelties, devices and appliances by the thousands, many of them unique or wonderful and all of them of interest. There seems to be no limitation in the line of the electrical field, a fact that will

be demonstrated by the hundreds of ways that electricity is applied to the daily necessities of mankind. All of this development will be displayed at the Coliseum.

"College Row" is going to be one of the features of the electrical show. Purdue, Illinois and Wisconsin universities are to make exhibits and also Armour Institute. Purdue will send a hundred or more students to Chicago to visit the show and the University of Illinois will send the senior class of the department of

January 20. Vincent Gray is president of this organization. The Northwestern Electrical Association will hold its annual convention at the Great Northern hotel January 17 and 18, visiting the show in a body on the night of January 18, after which the members of the association will have a banquet. E. H. Williams, of LaCrosse, Wis., is president of this organization and Thos. R. Mercein is secretary and treasurer.

It is the general impression that the opening night of the show is to be by invitation only. While all of



electrical engineering to Chicago at the time of the exposition. Each of the spaces allotted to the universities will be decorated in the college colors and will be made a visiting headquarters for the alumni of the various schools.

During the two weeks of the electrical show there will be two conventions in Chicago, each of which will have a special day at the exposition. The first regular meeting of the American Electrical Salesmen's Association will take place at the Grand Pacific hotel Jan-

the leading men in the Electrical field will be present by invitation, the show will at the same time be formally opened to the public. It has been definitely settled that President Roosevelt will send his greetings in a wireless telegram on the opening night of the show. Dr. DeForest of the DeForest Wireless Telegraph Company arrived in Chicago from Washington a few days ago where he has made complete arrangements for the flashing of the message to the Coliseum. Dr. De Forest is perfecting instruments with which he



expects to break all long distance records, both direct and relay, with the wireless.

The man or woman who has not kept up-to-date on the subject of electricity in the household will find much of interest in this department of the exhibition. Complete kitchen equipments, including every variety of electrically-heated utensil from a tea kettle to a griddle, are shown. The Chicago Edison Company and the Simplex Electric Heating Company will exhibit complete cooking outfits with which demonstrations will be made for the benefit of the public. The Simplex Company will do considerable of the cooking for the restaurant as well as the larger part of the laundry work for this department. The household devices also cover a vast number of novelties ranging from sad irons, milk warmers, curling irons to electric heating pads which are used in place of hot-water bags. In contrast to these heating devices may be mentioned the small ice-making plants which are operated by electric motors. These are suitable for small stores, which carry perishable goods. A number of medical appliances are shown, such as vibrators and the like. The Chicago Edison Company will print a daily edition of the "Electric City" in the building throughout the exposition.

Among the most wonderful and interesting of the

many demonstrations to be made will be the stunts that G. H. Thordarson of this city will produce with 600,000 volts of electricity, producing a marvelous electric spark nearly 10 feet long. This is by the method technically known as the "high potential enormous frequency current." For these experiments Mr. Thordarson has had specially made a sheet of plate glass weighing 700 pounds.

In telephone lines all the latest devices will be shown, and almost every type of instrument will be presented from the beginning up to the present high development of the art.

### Railroads Give Rates.

The Central and Western Passenger associations have granted a one and one-third round trip rate in their respective territories to Chicago on account of the meeting of the Northwestern Electrical Association January 17 to 19, and the Central Passenger Association on account of the meeting of the Allied Electrical Trades Association January 22 to 27. All persons attending either of these meetings can avail themselves of these reduced rates by purchasing tickets to Chicago and getting a certificate from their local agent.

## Badgers Meet at Milwaukee

The annual meeting of the Independent Telephone Association of Wisconsin was called to order in the club rooms of the Hotel Pfister on Wednesday, December 20, 1905, at 12:45 p. m., President Richard Valentine in the chair.

The chair opened the meeting with the suggestion that a resolution passed a year ago depriving Bell sub-licensees of membership, be put into effect or a new resolution be adopted and made effective. In accordance with the suggestion, J. C. Harper and W. F. Goodrich were appointed a committee to draft resolutions regarding the sub-licensee question referred to. The chair suggested that the powers of the committee be enlarged to include the preparation of a resolution to be presented to the Milwaukee Common Council in advocacy of an Independent franchise in Milwaukee. Mr. Harper suggested that a separate and larger committee be appointed for this purpose. He moved that a committee of five members of the association be appointed to draft suitable resolutions to be presented to the Common Council. The motion was carried unanimously.

The chair appointed the following committee: Professor G. W. Wilder, Mr. Webb, Mr. Harper, Captain Baer and Mr. Bates.

Considerable discussion here ensued as to whether or not it would be advisable to present the resolution to the judiciary committee of the council, which met that day at 2 p. m, and had the telephone matter in charge, or to wait and present it to the entire council when the matter came up for final disposition. The discussion was participated in by Messrs. Max Zabel, Harper, and Don Farnsworth. It seemed to be the final concurrent opinion that the resolutions should be drafted at once and presented to the judiciary committee of the council that afternoon and argued by a member of the resolutions

committee of the association; then when the matter came up before the whole council, to again bring in the resolutions through some friendly member of the council. Accordingly, after lunch, the association met and adjourned to the place of meeting of the judiciary committee of the council, there to present the resolution prepared in the meantime.

The question under discussion before the judiciary committee was whether a flat rate or measured service system is preferable, and Mr. Valentine, representing the Wisconsin Independent Telephone Association, was called upon to express his views. He said:

"Representing the Independent Telephone Association, of which there are quite a large number of companies in membership, I have yet to find one of our companies that is not opposed to a measured service system. I have talked with all of those that are represented at our convention here today, and there are none of them in favor of a measured service plan. We do not believe it could be successful in any city where the competition is strong. Of course, where a company has a monopoly, they can do about as they have a mind to. There is no doubt but that a measured service is a mighty good thing for the company. There is more money in it. If there was not, they would not have adopted it as they have in Chicago, and, I presume, more or less in Milwaukee, but I do not think any of us could compete with the Bell company a month on a measured service basis."

Others took exception to the views of Mr. Valentine. The question was argued before the committee pro and con by Max Zabel, Don Farnsworth, of Farnsworth & Bills, Chicago; by H. D. Stroud, in favor of measured service, and by Mr. Hoffman. The final upshot of the matter was that the committee decided to take no action, but to adjourn subject to the call of the chairman, who

stated that the next meeting would take place in about two weeks. The committee seemed to be in accord as to the desirability of granting an Independent franchise, therefore the association did not present the resolutions it had prepared favoring the adoption of such a franchise.

On motion the association adjourned to reconvene the next day at the Hotel Pfister at 10 a. m.

#### SECOND DAY'S SESSION.

After the meeting was called to order the president called for the reports of committees.

Mr. Harper, for the committee on resolutions, presented the following:

"Whereas, This association is organized on the principle of other state associations and is affiliated with the National Interstate Independent Telephone Association; and

"Whereas, On January 25, 1901, this association passed a resolution now construed to refer to all Bell sub-licensee companies in this state; therefore be it

"Resolved, That the secretary be and is hereby instructed to accept no more dues from Bell sub-licensee companies, and that their names be stricken from the membership roll of this association at once."

On motion the above unanimous report of the committee was adopted without a dissenting voice.

After some discussion it was decided that the committee on resolutions shall draft a suitable resolution urging the common council of Milwaukee to take as speedy action as possible on the telephone matter, consistently with a proper consideration of the subject; that the council grant an Independent franchise as soon as possible, and that the resolutions be worded so as to convey the expressed intentions of the association, signed by the members of the committee for the association and introduced before the council at the proper time by some alderman friendly to the project.

On motion of Mr. Bell a committee was appointed on nomination of officers for the ensuing year. The chair appointed W. J. Bell, of Deerfield; Dr. G. N. Hidershide, of Arcadia, and Charles Shernocker, of Sun Prairie.

S. A. Dinsmore showed volume I, number I, of the *Illinois Telephone Exchange News*, under date of December, 1905, and declared it to be published in the interest of Bell sub-licensee companies allied with the Central Union Telephone Company. The ensuing discussion brought out certain particulars with regard to the formation of a sub-licensee association in Illinois, and also in Wisconsin, where it was stated that the Wisconsin (Bell) Telephone Company fostered the organization of sub-licensee associations, going even to the extent of paying the railroad fare and other expenses of the delegates.

The chair urged that some action ought to be taken to enforce the provisions of the telephone law passed at the last session of the legislature. The Wisconsin Telephone Company, he said, is paying no attention to the law, believing it to be unconstitutional, but he had taken the opinion of several of the ablest lawyers in the state, including that of the attorney general, all of whom declared the law to be valid. He said, however, that the association should not expect the attorney general to do all the work; some able lawyer should be retained to assist him. Some funds already have been subscribed by local Independent bodies, but the need is for more money still. If the law can be enforced and the Bell company prevented from discriminating in its rates between cities

of the same class, the Independent companies will have won a large point in their favor.

The president described in part the active campaign that is being waged by the Bell in Wisconsin, and said that wherever any members of the association got wind of any new outbreak, some one should be sent there to reason with the Independent company under suspicion, before they signed up as Bell sub-licensees. He related several instances where he had appeared in time to head off projected Bell encroachments.

J. Shirley Eaton, of New York, representing the Poulsen Automatic Telegraphphone, was introduced and made a speech describing the device. He said that Mr. Poulsen, the inventor, had discovered that he could absolutely localize magnetism in virgin steel, and on this principle the telegraphphone is based. The principle was enunciated and shown at the Paris Exposition in 1900; five years have elapsed and the principle has been applied commercially. Three machines are in successful operation for different purposes. One of these groups of machines is that which permanently records telephonic communications. The telegraphphone makes a permanent record of any conversation on a steel wire and will repeat that record as many times as required. The speaker said that the test had run up to 38,000 times. The record can be wiped off at any time by simply demagnetizing the wire. Mr. Eaton described the practical operation of the machine in detail, greatly interesting the members of the association.

The report of the secretary for the year 1905 was of considerable interest. From the report it appears that the association has 16 active and 29 associate members, and embraces approximately three-fourths of the Independent organization in the state. The number of Independent telephone companies in the state is increasing steadily. Forty-one new companies were incorporated in Wisconsin in 1902; forty-nine in 1903; thirty-two in 1904, and during the present year thirty-nine new companies have been organized with a capital of \$415,000. A careful estimate of the Independent companies in the state gives a total of 300 Independent companies with an investment of \$4,000,000. There are 1,300 toll stations, 375 exchanges and 42,000 subscribers.

The secretary reported a net indebtedness of \$336.85, which he declared would be met as soon as enough of the members come up with their dues. It will probably be necessary, however, to levy a small assessment.

On motion the report of the secretary was adopted. His suggestion with regard to an assessment to pay the indebtedness of the association was acted upon, and an assessment of two cents per telephone and two cents per mile of toll line was levied on the members of the association.

The secretary presented the names of the Chippewa County Telephone Company and the Deerfield Telephone Company, both of which were unanimously elected members of the association.

The president next called for the report of the committee on nominations, whose report was unanimously adopted, and the nominees were unanimously elected for the coming year. Officers so elected are as follows:

President, Richard Valentine, Janesville; vice-president, J. C. Kuoni, Sauk City; secretary and treasurer, W. F. Goodrich, La Crosse; executive committee—William Van Middlesworth, Racine; Philip Sheridan, Green Bay; J. C. Harper, Madison; E. I. Bates, Chippewa Falls;

John M. Baer, Appleton; W. J. Bell, Deerfield; J. C. Crowley, West Superior.

President Valentine, in a few well chosen words, thanked the association for the honor done him in re-electing him to the highest office in the gift of the association.

On motion of Mr. Goodrich, the time and place of holding the next annual meeting of the association was left with the executive committee to determine.

Mr. Dinsmore, on behalf of the Electrical Trades Exposition Company, invited the members of the association to attend the exposition in Chicago, and announced that the railroads had agreed to give the regular excursion rates—a fare and a third, for the round trip. He mentioned the fact that the general manager of the exposition, Thomas R. Mercein, is a Milwaukeean, having been secretary of the Northwestern Electrical Association for several years.

Following a few brief remarks by Mr. Bell, the association adjourned sine die.

Following is a list of those who registered as attending the meeting:

J. C. Harper, Dana County Telephone Co., Madison; W. J. Bell, Deerfield Telephone Co., Deerfield; C. W. Forbes, United Telephone & Telegraph Co., Chicago; E. Sipperly, Badger Telephone & Telegraph Co., Milwaukee; R. Valentine, Rock County Telephone Co., Janesville; W. F. Goodrich, LaCrosse Telephone Co., LaCrosse; H. Teasdale, Monroe County Telephone Co., Sparta; F. W. McKinney and Andrew MacIntosh, Edgerton Telephone Co., Edgerton; Alfred Slater, Beloit Telephone Co., Beloit; R. M. Richmond, Evansville Telephone Co., Evansville; H. C. Willitz, Rock County Farmers' Telephone Co., Janesville; G. W. Wilder, Cambridge Telephone Co., Cambridge; E. I. Bates, Chippewa County Telephone Co., Chippewa Falls; B. H. Wells and A. D. Burdick, Milton and Milton Junction Telephone Co., Milton; Dr. G. N. Hidershede, Western Wisconsin Telephone Co., Arcadia; A. M. Webb, Jefferson County Telephone Co., Fort Atkinson; J. M. Baer, Fox River Valley Telephone Co., Appleton; Don Farnsworth, F. L. Bills and J. W. Wegner, West Shore Telephone & Telegraph Co.; John Rosenheimer, Jr., Cedar Lake Telephone Co., Schleisingerville; H. D. Stroud, People's Postal Telegraph Co., Milwaukee; Fred. Mintzlaff, Grafton Telephone Co., Grafton; C. N. Fisher, Plymouth Telephone Co., Plymouth; D. L. Bester, Mazomanie Telephone Co., Mazomanie; H. B. Grave, W. F. Pinnow and A. A. Poulsen, Eastern Wisconsin Telephone Co., Kiel; H. E. Rosenow, Badger Telephone Co., Oconomowoc; R. J. Penhallegan, Mineral Point Telephone Co., Mineral Point; W. P. Hyland and Fred M. Cole, Ashland Home Telephone Co., Ashland; A. G. Slater and C. R. Clausen, Waupaca Telephone Co., Waupaca; Charles Scherneck, Interurban Telephone Co., Sun Prairie; J. V. Schmidt, Troy & Honey Creek Telephone Co., Sauk City; J. J. Weirich, Monroe Telephone Co., Monroe; Mrs. C. A. Colonius, Central Wisconsin Telephone Co., Portage.

Following is a list of the exhibitors at the Wisconsin convention:

Julius Andrae & Sons Co., Milwaukee; by H. P. Andrae and J. C. Schmidtbauer.

Frank B. Cook, Chicago; by F. W. Pardee, P. M. Chamberlin and R. E. Macduff.

Kellogg Switchboard & Supply Co., Chicago; by Frank Rotchka.

Vought-Berger Co., LaCrosse; by P. W. Goodman.

American Electric Telephone Co., Chicago; by M. W. Zabel and J. C. Henderson.

Illinois Electric Co., Chicago; by E. A. Quarfoot and N. G. Harvey.

Standard Telephone & Electric Co., Milwaukee; by H. M. Eldred and H. C. Biester.

Stromberg-Carlson Telephone Manufacturing Co., Chicago; by J. J. Nate.

Milwaukee Telephone Manufacturing Co., Milwaukee; by F. J. Whittemore and A. Gaiger.

Independent Telephone Manufacturing Co., Madison; by A. L. Burch and Frank Quinn.

Armour Institute, Chicago; by Dr. G. W. Wilder.

Sterling Electric Co., Lafayette; by H. T. Doolittle.

Monarch Telephone Manufacturing Co., Chicago; by L. O. Trumbull and A. Duncombe.

Electrical Appliance Co., Chicago; by S. A. Dinsmore and J. B. McMullen.

Miller Anchor Co., Norwalk, Ohio; by G. H. Miller.

North Electric Co., Cleveland, Ohio; by I. J. Kusel.

John A. Roebling Sons Co., Chicago; by A. Wissler.

Automatic Electric Co., Chicago; by C. L. Fisher.

Standard Underground Cable Co., Chicago; by Mr. O'Neill.

### Central Illinois Association Meets.

Participating in the most important meeting ever held by the Independent telephone interests of Central Illinois, managers and owners of fifty Independent telephone exchanges in the Fifth district, deliberated Friday and Saturday, January 5 and 6, in the parlors of the Fey Hotel in Peoria on the arrangement of equitable toll rates within the district.

The Fifth district comprises the counties of Peoria, Marshall, Tazewell, Mason and Logan, in which are 108 exchanges operated by 65 different concerns. The cry for the past few years has been the equalization of freight rates in the district. This demand has become more persistent since the opening of the Interstate Company in Peoria, which is opposing the Central Union at every turn of the road, and which is gaining ground in Peoria at a pace that is startling.

Peoria is the hub of the Independent business of the central portion of the state. The 108 exchanges connect with 30,000 'phones and have 6,000 miles of toll wire. The business has been on the increase during the past three or four months as never before, and the question was staring the Independent managers and owners squarely in the face: "How can we meet the toll question, and solve it so that every interest will be served the same?"

This is the question which confronted the Central Illinois Telephone Association, the members of which met here last week. The toll rate committee, composed of James Barrett, of Pekin, J. S. Dailey, of Chillicothe, and C. A. Camp, of Sparland, was busily engaged in the solution of the question. It is an enormous task and only a partial report of the committee was made at the meeting. In order that the association shall receive the best arrangement that may possibly be made by this trio of expert telephone men, the reception of the report is made the special order of business at the April meeting of the association. The main object of the work of the committee is to arrange an equitable table of toll rates that

shall obtain throughout the district, and which shall result in an equal distribution of the earnings of each line over which the message was transmitted.

The partial report of the toll rate committee which was presented in writing to the association favors the establishment of a clearing house for the central portion of the state, each exchange to turn the earnings of the office into the clearing house and the distribution of the earnings to be made pro rata according to the mileage to the participating companies. Such a practice will be welcomed by the majority of the members of the association, which includes practically every proprietor or manager of Independent telephone exchanges in the five counties.

For a number of years there has been between the various exchanges a working agreement which has been far from satisfactory, but which was continued because of the demands made by the public on the different companies. The demand has been felt for a number of years for a more equitable agreement and the greater majority of the exchanges are willing to participate in the clearing house scheme.

Other immediate territory not included within the

Fifth district is in territory contiguous to Peoria, and Messrs. Barrett, Dailey and Camp, composing the toll rate committee, will present the plan to owners of the business in this territory. This will lead to the connection of thousands of other 'phones, which will increase the business which will both originate and terminate in the territory. The special toll rate committee was given this as an added task during the next three months, and when the report is received at the April meeting the new working card will be presented for adoption.

The action of the meeting last week in Peoria is looked upon as an advance step in the telephone world to secure the rights for the Independents, whose business is constantly on the increase, both in the cities and in the smaller communities.

Activity in the construction of telephone toll lines in Central Illinois will far surpass any previous years. With the connection of Washington and Peoria, a distance of twelve miles, an outlet will be given for the business of the main line north and south through El Paso, and the promoters anticipate that the year 1906 will be the greatest in the history of telephony in Illinois.

## Work of Dominion Telephone Committee

F. DAGGER, in "CANADIAN MUNICIPAL JOURNAL."

If an apology were needed for the presentation of a paper on the subject of telephones before the representatives of the many municipal corporations in this Dominion, it may be found in the fact that the telephone is daily becoming more and more of a necessity to the daily life of the citizens of Canada. The provision of a satisfactory telephone service at a cost which will place it within the reach of the people has become of recent years one of the most important questions with which our civic legislators



F. DAGGER

of dividends for the shareholders of private companies, it has become necessary for the municipalities to seriously consider what methods can be adopted to secure reasonable control of the property of which they are the custodians. With a view to accomplishing this end, efforts have been made by the Union of Canadian Municipalities in recent years to obtain from the Dominion Government such legislation as will secure to the municipalities adequate protection of their rights in regard to the use of municipal property by telephone companies. Referring to the present law in regard to this matter, it is fair to state that when the rights enjoyed by the Bell Telephone Company were granted in 1880, it was never anticipated that the growth of the telephone would assume such enormous proportions as it has today.

The existence of the present rights enjoyed by the earlier telephone companies undoubtedly enabled them to build up a large business throughout Canada and to obtain practically a monopoly of the telephone service of this Dominion. It is a matter of common experience that a monopoly in any business carried on for private gain has always been attended by certain evils which do not exist in the case of a State or municipal monopoly, or in private competition. The telephone service has been no exception to this rule, and in recent years many of our public men have become impressed with the fact that there is room for improvement in the telephonic conditions of Canada. Foremost among those who have considered this question is Sir William Mulock, and it is largely due to the foresight, progressive spirit, and energy which is characteristic of that gentleman, that the work about which I am to speak today has been carried to its present stage.

Recognizing the necessity for some action in connection with existing telephonic conditions, in March last, Sir William Mulock secured the appointment of a select committee "to enquire into and report regarding the various telephone systems in operation in Canada and elsewhere, and to consider what changes, if any, are advis-

have to deal. The increasing demand for this utility among all classes of people justifies the statement that the telephone is no longer a luxury for the few, but has taken its place among the public utilities of the country second only to that of electric lighting.

More than this, inasmuch as no telephone service can be provided without making an almost unlimited use of the streets and highways of the municipalities, either by the erection of poles or the laying of conduits, thereby utilizing the property of the rate-payers for the creation



able in respect of the methods at present in force for furnishing telephone service to the public."

That committee held its first meeting on March 20th last, and since that date it has held thirty-seven meetings and examined over fifty witnesses, whose testimony covers about 1,600 pages of most instructive and interesting reading.

Before proceeding to summarize the evidence so far as the limited space of this paper will permit, I desire to say that it is only my intention to give the facts so far as they have been made to the public by order of the committee, and I further wish it to be understood that any opinions, which may be expressed by me in the course of this paper are my own personal convictions and must not be taken as representing the opinions of any members of the select committee, or as forshadowing the ultimate result of the inquiry.

As you are no doubt aware, the committee, in consequence of the prorogation of Parliament, has gone out of existence and it will, therefore, be necessary to appoint a new committee next year, the evidence taken in the meantime having been laid on the table of the House with out any report or recommendation being made.

I do not propose to deal with the evidence of the Bell Telephone Company at any length, for the reason that the majority of those here present are perfectly familiar with the operations of that company. It may, however, be of interest to bring out a few points relative to the testimony of that company's officials.

For some years the prevalent belief has existed that a large proportion of the stock of the Bell Telephone Company, of Canada, was held by the American Bell Telephone Company and its successors, for the use of patents which have long since expired. In regard to this matter, President Sise has denied on oath that the American Bell Telephone Company, or its successors, acquired any stock not represented by cash payments, with the exception of \$386,600, being the amount which he claims was issued to the Canadian Telephone Company, Limited, for license and patents, and subsequently transferred to the American Bell Telephone Company. It may be here stated, however, as showing the interests which the American Telephone & Telegraph Company, the successors of the American Bell Company, has in its Canadian offshoot, that out of a total stock issue on December 31, 1904, of \$7,916,960, that company holds \$3,083,700, and further on a board consisting of eight directors is represented by its president and two other prominent officials. It will, therefore, be seen that American interests figure very prominently in the affairs of the Bell Telephone Company of Canada. It is further, a matter of record that on December 31st last, the company had, in addition to capital and money borrowed amounting to \$9,916,000, assets value \$2,190,210, or \$33.14 for each of the 66,160 telephones in service on that date including inside extension telephones in public buildings, hotels, and large business premises not connected with the exchanges by direct wire. The company has in addition written off large sums for depreciation, renewed its obsolete plant and improved its system from time to time, so that the value on the company's books equals its total capital and bond issue. That the company has been able to accomplish all this and pay a dividend of eight per cent, to its stockholders is a proof that its rates are certainly very remunerative, and that it has as yet had no cause to complain of any legislation regarding its business. Judged solely as a monopoly, I do not think it can be said that anything has transpired during the

enquiry beyond the fact that the company's officers have taken every legitimate means to protect its business and retain control of the field. In the larger cities and towns the system has been fairly well developed, though there are complaints of high rates. For instance, there does not appear to be any justification for charging subscribers an increased rental of \$5 per annum for the installation of a modern equipment, which clearly should be done at the cost of the company and not that of the subscriber. Further than this, evidence has been given before the committee that the manufacturing costs of the old "Blake" and the new long-distance transmitter were in the ratio of \$2 to \$1 in favor of the latter.

The examination of Bell officials has also made prominent the fact that there has been no serious effort made to develop the service in villages and rural districts. The company's returns show that in 156 exchanges, aggregating a total population of 91,266 there was on December 31st last, only 536 telephones, or one telephone to every 170 inhabitants, and this list includes fifty-nine villages with an average population of five hundred each, with only one telephone. In the rural communities included in the territory of the Bell Telephone Company (Quebec, Ontario and Manitoba), the company claims 2,000 rural telephones, which, taking the figures of last census, works out to one telephone to every 1,250 inhabitants. This is in striking contrast to the development in the United States, which, according to the latest available statistics, has an average of one telephone to twenty inhabitants, the figures for the following states being:

Iowa, 1 to 11; Indiana, 1 to 12, and Ohio 1 to 14.

The reason for this lack of development of the rural district is, no doubt, to be found in the fact that the company has hitherto found a more profitable field for the employment of its capital in the larger cities and towns. Whether this be so or not, the conditions today demand that the dwellers in the rural districts shall be provided with the means of communicating with their neighbors and with the market towns, and if the Bell Telephone Company does not furnish these facilities, it must not complain if the field is developed by others.

I now turn from the larger companies to the smaller Independent systems, which may be classified as follows:

1. Municipally owned systems.
2. Independent local companies.
3. Rural or farmers' line systems.

Regarding the first, so much has been said and published in reference to the far-famed systems of Port Arthur (Canada) and Fort Williams (Canada) that I feel I am in danger of rehearsing ancient history if I take up the time of the convention on these systems. The committee had the advantage of hearing so competent a witness as ex-Mayor Dyke, of Fort Williams, who is with us today, the able pioneer of municipal telephony in Ontario. That gentleman's testimony shows a remarkable development in a very short time in both these progressive towns, and is a tangible proof of the success which invariably attends a well-managed system under local control and supported by loyal citizens, as compared with the failures to satisfy public requirements which too often follows in the wake of a system controlled by a company whose management is centralized at a point hundreds of miles distant, and in whose financial affairs the local citizens have no interest.

The next municipal system of importance is that of Nepawa, Manitoba, and to this enterprising municipality is due the credit of having established the first municipal

telephone plant in Canada. This system has also been most successful, and according to the latest information furnished the committee, has 180 telephones, 87 of which are business connections, one to every 13 inhabitants, the rates being \$20 per annum for business and \$10 for residence telephones. The municipality has recently installed a modern central equipment, is paying five per cent, on its debentures and providing a sinking fund. The Bell Telephone Company had 75 telephones before the municipal system was established; at this date it has nine. It is, perhaps, right to state that in the three towns named the telephone systems are being operated in conjunction with the electric light plants, thereby securing the advantage of a division of maintenance expenses. This is certainly an economy, but how far it contributes toward the financial success of these systems I am not prepared to say. These towns, however, furnish an encouraging example to other municipalities owning and operating electric light plants. The city of Edmonton has recently embarked on a municipal telephone undertaking, having on January 1 last (1905), acquired the local system in that district in order to prevent its falling into the hands of the Bell Telephone Company. As the municipality is still operating the old plant, the committee received little information regarding its financial condition. It is, I believe, the intention to reconstruct the whole system, bring it up to date, and make a substantial reduction in the charges.

A fourth municipal telephone plant is in operation at Kenora, Ontario (formerly Rat Portage), with 180 telephones, the rates charged being \$35 for business and \$15 for residence telephones, but beyond this the committee has no information.

An important witness heard in connection with municipal telephones was Alderman MacRae, of St. John, N. B., who gave much valuable testimony in regard to the efforts of his municipality to establish a municipal system.

Among the most important facts brought out during the inquiry is the large number of small Independent telephone systems operating in Canada. So far as can be accurately ascertained, there are 112 of the systems in Canada, distributed as follows:

Ontario .....	34
Quebec .....	28
Nova Scotia .....	24
New Brunswick .....	17
Manitoba .....	3
Saskatchewan .....	2

Alberta, British Columbia and the Yukon have one each. Out of 68 of these companies in the territory operated by the Bell Telephone Company, 31 have arrangements for the interchange of service with that company. In Nova Scotia nine companies have similar agreements with the Nova Scotia Telephone Company, and the manager states further that they connect with all the systems in the province but one. In New Brunswick, the New Brunswick Telephone Company connects with five of these systems. The terms on which this interchange of service is effected in the majority of cases bind the smaller systems to use "Bell" apparatus, and limit the extension of the service within areas specified by the larger companies. This arrangement in effect secures to the large companies a monopoly of the territory, and prevents an active development of the field. Returns have been received from fifty of these Independent systems, showing approximately a total of 9,000 telephones in operation.

The following is a summary of the annual rates charged and the number of companies:

\$5 to \$10 for business, six companies; for residence, six companies.

\$10 to \$15 for business, nine companies; for residence, 20 companies.

\$15 to \$20 for business, seven companies; for residence, 33 companies.

\$20 to \$25 for business, seven companies; for residence, 2 companies.

\$25 to \$30 for business, 2 companies; for residence, 2 companies: Sydney, C. B. and Merchants' Company, of Montreal.

\$30 to \$40 for business, 2 companies: Sydney, C. B., and Cranbrook, B. C.

Several of the smaller companies operate only toll stations, making a charge of 10 to 15 cents per message, with an extra charge for delivery; while some of the rural systems are operated as co-operative associations, each member paying his proportion of the cost of construction, which according to the evidence heard varies from \$30 to \$50 per telephone, and in addition contributing to the cost of operation and maintenance, which varies from \$3 to \$6 per annum. This method, in my opinion, furnishes probably the most satisfactory solution to the problem of how best to develop the rural districts of Canada, but this subject is too important a one to be discussed within the limits of this address. I may say, however, that I do not think municipalities are sufficiently alive to the importance of covering the rural districts with telephone service. I am convinced that in the case of two adjacent municipalities, one having a rural telephone service, and the other without such facilities, that the flow of business would follow the telephone wires. For this reason municipalities should, so far as they are able, assist in encouraging the development of telephone systems among the farmers, from whom their townsmen derive a large proportion of their livelihood.

*(To be continued.)*

#### Had 'em of Her Own.

"How cheerful Mrs. Biggleson is looking lately."

"Yes they've given up their individual telephone and had a party-line instrument put in. She never has time to borrow trouble any more."

The Frost Cross-arm & Lumber Manufacturing Company, incorporated, Cleveland, Ohio, has purchased some 12,000 acres of land and timber of long-leaf yellow pine near Ocala, Fla., on the Atlantic Coast Line Railroad. The company is erecting a new and modern mill at this point, which will have five times the capacity of its present plant at Chesterfield, S. C. The company will make a specialty of long-leaf, all heart yellow pine cross arms. It expects to be in a position to accept orders in the very near future. It will have but one southern office, and this will be located in Florida. Its general offices will probably be moved from Cleveland, Ohio, to some point near Philadelphia, Pa. The name of the company will, in all probability, be changed to the Lake Yale Lumber Company.

The Petersburg, Ill., Telephone Company will build a new exchange at Greenview, Ill.

The Red Oak, Ia., Mutual Telephone Company has increased its capital stock to \$15,000.

# Useful Co-operation

BY W. C. KERR, IN THE ELECTRIC JOURNAL

A political editorial once began with the analogy: "There are two kinds of rubber overshoes—bad and blank bad; the former are difficult to obtain." If co-operation be reckoned by what is easily obtainable, its quality and quantity are scarcely satisfactory. This does not seem to reflect upon intent, but to a considerable degree measures limitations. The reason we find so little co-operation is that so few know what it is, fewer yet know how to use it, and opportunity is ever as elusive as a wandering purpose permits. As Mr. Dooley said of work: "If it's wurruk yure lookin' fur thar's lots of it around here that nobody's a doin'."

The present is a time at which there seems to be an unusual tendency towards co-operation. It seems more like a tendency than a definite practice. It is frequently too abstract to be effective, too variable to be relied on, too spasmodic to be useful.

Just what are we talking about? What is co-operation anyway? Aside from the common definition of "working together to one end," co-operation seems to mean what any man happens to have in mind when he uses the word. In a rudimentary way, observation would suggest that to one it means—help me make a sale; to another—give me low prices, or lend me your paw to pull my chestnuts out of the fire. Sometimes it may appear to mean—listen to me and do what I say; or what's mine is mine and what's yours is mine. Rarely is it—what can I do for you? or, how can we combine forces for the common good?

Co-operation to us should be the intelligent and loyal combination of the knowledge, skill, and strength of position acquired through years of service. Did it ever occur to you what potential strength there is in our general interests which can within itself conceive, design, and create a comprehensive property and furnish most of the chief apparatus for it? Or did you ever realize the extent to which our varied activities could be lifted to a plane high above others if the fullest advantage were taken of our opportunities possessed by no other interest or combination of interests? These activities cannot be elevated separately. They must rise together. Just write the word corporation several times and then see how much harder this has made it to write co-operation. Perhaps we have been too intent on our "daily grind" to perceive the latent power of the waters that flow by our mill.

No one seems to doubt the desirability of co-operation between varied interests such as are gathered under our banner. All seem to realize that it is potent for good. I have never heard of any one volunteering to set up his own practice as a guide for others in determining what co-operation is or how it can be effectively practiced.

The co-operation sphere seems to me to be a ball of many colors, slowly rotating, and while it appears to constantly show the same general form, its various sides, colors, markings, and other characteristics appear over the horizon and disappear with an ephemeral rapidity which leaves behind only an intangible impression.

Co-operation often seems to be a matter of the moment, defined by instantaneous needs, and usually regarded, with a certain accumulativeness of human in-

stinct, as something that is coming to one rather than going from him.

From what I have seen in twenty-three years, I have a firm belief that one difficulty in obtaining true co-operation lies in the fact that we have a very imperfect idea of what we are trying to obtain. Some things are hard to define. Entomologists have tried to define the word "insect," but a very astute authority prefaced his writings by stating that he had found this so difficult that he would suggest the reader to catch a grasshopper, look at it for a while, and gain his own impressions regarding the main characteristics of an insect.

I think the best idea of co-operation will be the impression obtained by any one through experience with true co-operation, regardless of just what form it may take. The real thing is rare, though it is frequently approximated in various degrees. Instead of definition, it may be more useful to apprehend some of the basic principles which underlie it.

The first of these is corporate unselfishness; the second is administrative unselfishness; and the third is personal unselfishness. With a selfish motive, co-operation cannot exist.

The next necessity is diligence. Laziness can only co-operate negatively, by doing nothing harmful. Passiveness is seldom useful. In a matter of this kind, you can't be passive. You either co-operate or you don't, and if you don't there is a failure at your door. All things are more or less hard to do and faithful diligence is requisite in doing those things which create the platform on which co-operation can rest.

Our interests breathe the gale of advancing and ever changing arts, with all their complexities, anomalies, and uncertainties. With us nothing there is can pause or stay." Thus our duty is made harder to perform than if we lived in the quiet atmosphere of conventional operations. Difficulties and their overcoming bring opportunities, and who would ask for ease at the price of stagnation? It was Tacitus who created a solitude and called it peace.

Another necessity is honesty of purpose, which involves truthfulness; not merely the willingness to tell the truth, but the ability.

There must be a strong motive of the kind that makes men successful in the world and then keeps them successful after they get there, which motive is an assemblage of virtues, of which the shortest expression is "the real thing." All pretensions, shams, subterfuges, sharp practices, equivocations, pettiness, double meanings, half answers, procrastinations, autocratic manners and other alverse elements of human nature must be expurged from motive and practice before "the real thing" exists, and until you have the real thing and lots of it you will have no co-operation.

Co-operation is a bigger power in the world than is implied by its limited application to the affairs of our several corporate interests. Like credit, it is a fundamental principle underlying successful action in the world of peace, commerce and war. It is practiced in nature by the ants and bees, and is more or less reflected in the principle of mechanics, even to the holding to-

gether of the solar system. So if any one thinks that co-operation is a little bit of a thing which we are more or less creating or failing to create, they are taking a very limited view of its sphere.

But we need not now concern ourselves with co-operation in its fulness applied to many things. We need it only with reference to its opportunity to serve the best interests of a dozen corporations and the men in them.

The laying down of laws for co-operation is useless. We may more or less systematize the results of practice, but the laws are the laws of purpose, of motive, of integrity, of unselfishness, of willingness to assist, of diligence, faithfulness, and fidelity to trust, and I think if it is viewed in any other way we will only get the imitation of the real thing, and all imitations are bad.

There is no room for co-operation that does not co-operate, and therefore it is only useful co-operation that interests us, and useful means, good for something. It has been said that any one who gets approximate justice in the world is doing very well. It is a common remark that nothing is perfect. We all know that our neighbors and friends are imperfect, and we even sometimes suspect ourselves. The perfectionist in this world has a hard time. He is subjected to continual disappointment. If he is chiefly worried about the imperfections of others, he may regard himself with complacency until he suffers the more severe fall because of the height his conceit has attained. If we will all assume that we are quite imperfect, that we express ourselves badly, and that our judgment is liable to considerable improvement by contact with that of others, we may add something of a desirable personal attitude to the basic principles already recounted.

If then we come to co-operation in a spirit of true helpfulness we may make it real, and if it is real it may be useful.

There is little hope of the representatives of any concern co-operating with those of any other unless they have the ability to co-operate among themselves. If from the corporate management of any organization down the ranks to those in least authority, there cannot be a wholesome co-operation, free from jealousy, and with all efforts bent to one end, it is useless to ask the members of that organization to co-operate with others further removed.

Co-operation, like charity, begins at home. These virtues have several features in common, which I have not time to relate. Internal co-operation within a given organization is facilitated by success, pleasantries, mutual understanding, close acquaintance, and charity for each other's shortcomings. It cannot be ordered and the lack of it is even difficult to censure. There are so many men with so many minds that each is too much inclined to be a law unto himself. Co-operation cannot be purchased, but it can be inspired. Some one once remarked that "money will buy a pretty good dog, but it won't buy the wag of his tail." If you want internal co-operation, the way to have it is to get busy and co-operate and never miss a chance. Lean over backwards to do it. See how much you can do to help some one else, instead of how little, and if each concern within our interest will get this spirit it will get something useful and ripe for extension.

Any man conspicuously lacking in these characteristics has in him something of smallness, selfishness, even meanness, which it is his business to get rid of, and he can get rid of it quickly, providing he possess any qualities which as he grows older will make him better than

he now is. If a man with advancing years, knowledge, and experience cannot grow better, wiser, and more competent to handle the affairs entrusted to him, he has reached the full limit of usefulness, has begun to go to seed, and will not be wanted long in the world's activity.

I therefore assume that the men I am talking to and about are capable of being many times as good and effective as they now are. Effectiveness gets fairly weighed and compensated by the world's scales. No man is paid for what he is going to do. He is only partially compensated for what he has done. There must be a profit in everything, and therefore no man is paid as much as he is worth. His ability to perform must be bought at one price and sold for another. If he grows, his compensation will grow, and no small part of growth is the ability to rise and do the things that need to be done, no matter what they are; to rise from selfishness to unselfishness, from smallness to greatness, with competency in all of the detail involved in these important advances.

Now let us get all of the men within any organization on the right track and get them going with a vis viva which is real and you will find effectiveness increased many fold. It will then be easy to exert these influences in a way which will enable the co-operative spirit to extend out to those less closely connected. Then it will be possible for our numerous organizations to achieve the co-operation we all desire. Begin at home and then go visiting.

Specific co-operation between men and corporations with divers interests is fraught with many embarrassments. The different concerns have not the same motive. They do not do exactly the same things. Their way of securing business is different. They appeal perhaps to a different set of customers. Some appeal to the few, others to the many. In some the constructive spirit predominates, in others the commercial. In some the motive is wholly that of manufacture and sale, in others it is engineering and professional. In some the essence or objectivity of the corporation resides principally under a roof, in others it is essentially in the field.

Nevertheless, all these differences are secondary to the fact that every man from the highest executive position to the lowest rank of authority is exerting human effort for one general welfare, within one broad field known as applied science and more specifically as engineering. They therefore differ less in their main functions than the elements of daily practice would make it appear. Just as all mathematics can be reduced to a few rudimentary operations; just as the finest literature can be reduced to a few hundred words; just as variegated nature obeys a few fundamental laws—so can our seemingly diverse interests conform to a few essential requirements which, if faithfully carried out, will result in practical co-operation—hence useful.

The phases of co-operation as they arise may be casually considered as having several complexions. Co-operation is of but one kind. It is only the garb it wears which seems different. It may take the form of social entertainment between men in these various interests, among themselves or in the presence of customers, leading to good fellowship, mutual understandings, pleasantries, touch with affairs, and the general desire to do business together. This is a form of external co-operation, commonly known as "mixing," which is very desirable and too little cultivated.

Again, it may clothe itself in close relationship between officers, managers, and others in discussion of what



best serves their respective interests; and the policies which they should adopt towards certain matters of mutual importance. Their resulting views should be judiciously passed down the line so that many may co-operatively partake of them.

Again, it may comprise engineering, constructive, and manufacturing relationships by which the apparatus or practice of one is made to fit and serve with that of the other, requiring a different co-operative effort from that which affects the more public interests.

It may often take the form of concessions for helpfulness to others. These may involve the spending of time, thought, care or money.

Under certain conditions, co-operation involves the use of foresight in perceiving what would be of benefit to another by way of imparting information, whether it concerns sales, data on costs, or the diligent apprehension of technical information which should be volunteered, especially where one has orders placed with another, or even to the apparently minor incident of promptly and sufficiently supplying a print, sketch, diagram, or other exposition of knowledge.

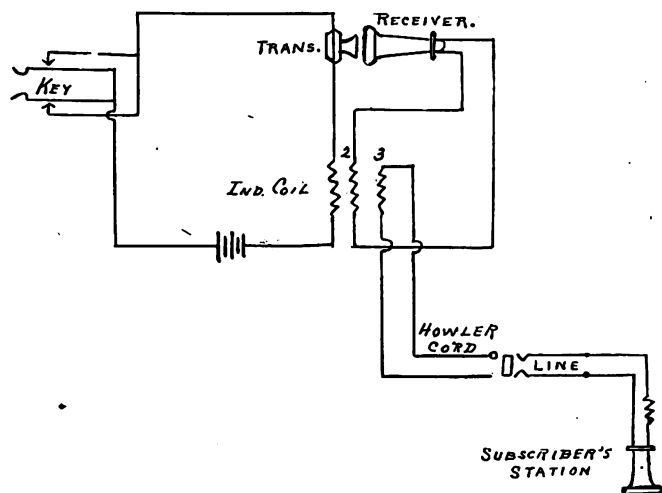
Some things are the little straws which, although small in themselves, are often greater in their importance than apprehended, and which properly handled produce a cumulative effect in co-operative desire.

Nothing is too small to co-operate upon. Nothing is too small to be good. No act too small to be kind and courteous. No man is able to know exactly what the result will be of anything he does. He thinks he knows, but he doesn't. The world has a way of judging what a man means by what he says, even though it doesn't size it just as he says it. Humanity is peculiarly adept at understanding people from their actions, especially their sustained and constant actions. Temporarily one may misjudge, but in the long run the old adage that "right wins out" is more true than the modern adage that "virtue is its only reward."

(To Be Continued.)

### Howler Circuits.

G. L. Griswold, of Chicago, suggests the following in answer to the query of A. L. R., in a recent issue of SOUND WAVES:



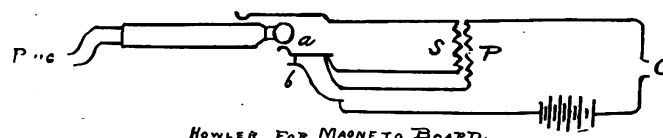
"The circuit consists of a transmitter and receiver which are fastened permanently in a box and just far enough apart to give forth the loudest noise when the

key is thrown to cause battery to flow through the primary winding of a three winding induction coil; the second or secondary winding is brought (as may be seen by the circuit) to the receiver, and the third winding is connected to a cord used only for the purpose."

Mr. Griswold suggests that all transmitters are not sensitive enough to produce a howling noise by having the receiver held up to it, and recommends a make of transmitter which he deems suitable for that purpose.

In answer to the same query, R. C. Cutting suggests the following "howler" for a magneto board:

"The enclosed sketch shows a cheap and simple method of making a howler. The secondary winding of an ordinary telephone induction coil is connected to the spring jack as shown, also one side of the primary to 'a' contact. The other side of the primary goes through



an ordinary buzzer (c) or door bell (or any contrivance rapidly to make and break the battery circuit) to the six cells of dry battery, to contact "b" of jack. The operator, inserting the plug into the jack, closes the primary circuit at "a" and "b"; the circuit breaker at "c" makes an interrupted current in the primary which induces an alternating current in the secondary, through the cord circuit to the subscriber's 'phone. If there is no spring jack suitable to make the contact at "a" and "b," an ordinary two-point switch can be put in the battery circuit, where the operators can reach it."

Have our readers any comments to offer?

The Hamilton Home Telephone Company of Hamilton, Ohio, has declared its eleventh quarterly dividend of one per cent. on its common stock. The company has had an unusually progressive year, having increased its number of 'phones over 1,000. This increase is indicative of the aggressive character of its management. W. Gilbert Thomson, the general manager, is well known in the telephone world and thoroughly understands Independent conditions in Southern Ohio.

The recent severe winds off Lake Michigan played havoc with the Independent Telephone Co. at Manistee, Mich., demolishing practically all their lines and causing them to start on the work of remodelling their entire equipment.

The city council of New Lexington, Ohio, has granted a new telephone franchise to J. B. Rhodes, of Zanesville, and T. J. Smith, of New Lexington. A new company is being organized and will be incorporated in a short time. It will be known as the New Lexington Telephone Company.

The Atlanta & Naples Telephone Company, of Bryan's Mill, Cass county, Texas, has been incorporated with a capital stock of \$5,000. The incorporators are E. W. King, W. O. Bryan and W. E. Bryan.

The Dan River Telephone Company, of Turbeville, Halifax County, Va., has been incorporated with a capital stock of \$5,000. W. B. Wilkins, president.

# Electrolysis on Cable Sheaths III.

F. LUBBERGER

A method will be described giving the necessary information about where and how much current escapes. It is true, the method is as simple as anything can be, but it takes time to take the readings. The principle may be explained with the aid of Fig. 6. The cable C is accessible at 7 points, e. g. 7 man holes. Two men can take the readings. Thin convenient wires are run from manhole to manhole. Preferably a small rubber covered wire is pulled through an empty conduit. In the manholes No. 1, 3, 5 and 7, the wires are clamped to the cable sheath; in manholes 2, 4 and 6 they are loose and carefully insulated. In the manholes 2, 4 and 6 an extra wire is clamped

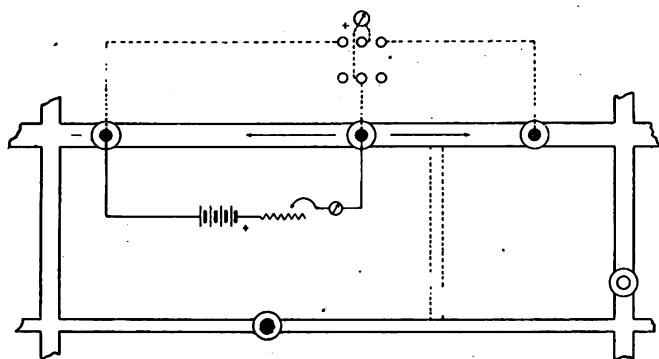


Fig. 6

on the cable sheath. All wires are left long enough to reach about 5 feet out of the manhole when uncovered.

Both testers connect their voltmeters at manhole 2. The first man connects his instrument between the manholes 1 and 2, the second man does so between manholes 2 and 3. The instruments are set on three leg chairs carried along by the men. One man lays his watch on the chair and calls the time every 5 seconds. At this moment both men take the readings and write them down. Both men note also what connection the readings belong to and also what polarity the manholes were connected on. Such readings at every 5 seconds are taken for about 15 minutes. Hereafter the readings will be called readings V 1-2 and V 2-3. Then the men go to the manhole No. 4 and repeat there the same readings for 15 minutes. After that the same process is repeated at the manhole No. 5.

All the data are given to the office and all conclusions can be arrived at by clerical work. To arrive at our conclusions we assume to start with the simplest conditions, i. e. The cable does not change its cross section from manhole 1 to manhole 7, and all the manholes have the same distance. The clerks plat all data on cross section paper and draw the curves. A curve is made with black ink for the readings of the first man, and with red ink for the data of the second man. For each set of readings at a manhole a separate sheet is to be used, the readings of the same moment to be platted on the same vertical cross-section line so that the red and black curves show at a glance the difference of the readings.

There are deflections V 6-7. That means that current is flowing in the tail end of the cable sheaths. If for readings V 6-7, the manhole 6 was positive, current was flowing from H6 to H7 i. e. as at the end of the cable of course no current is left, the current escapes between H6

and H7. If for the readings V6-7 the manhole No. 7 was positive, current was flowing from manhole 7 to manhole 6, i. e. current entered the cable between manholes H6 and H7.

Here would be the place to describe the method to find the amperes of the escaping or entering current. The description will be postponed to some later paragraphs in order not to interrupt the investigation.

Suppose a current of .015 amp. was found to escape between H6 and H7. A careful comparison of the black and red curves for the readings V 5-6 and V 6-7 shows whether the voltage of V 5-6 is higher or equal to or lower than the readings of V 6-7. If the curves are equal, no current enters or leaves the cable sheath H5-6. If V 5-6 is higher, current enters between H5 and H6, of course only if H5 is also positive.

The same row of conclusions is made for the readings V 3-4 and V 4-5; and again for the readings V 1-2 and V 2-3. If something interesting happens between H2 and H4 it is well to take the readings V 2-3 and V 3-4 at the same time.

The engineer will have to interpret the results. It cannot be the purpose of this article to mention all possible combinations. The principle is simple. The method allows to find where and how much current is escaping. It is certain that after some trials the dangerous places are located.

Suppose a bad leak is found between the manholes H3 and H4. In order to close in on the exact spot, if there is any, the best way is a careful inspection of the surrounding ground. If a water or gas pipe, a sewer or brook, or some other good conductor crosses the cable, it is very likely the spot to look after. If the inspection does not reveal anything, an insulated wire may be drawn in somehow in the space between the cable sheath and the conduit. Usually the cable does not closely fit the conduit so that it is worth while to try to get an insulated wire through. At one end of the insulated wire a brush of very fine copper wire is soldered to the conductor of the insulated wire. Then the brush is drawn into the con-

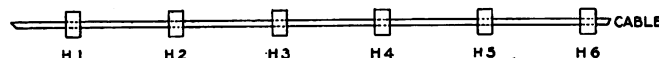


Fig. 7

duit. The brush makes a good contact on the cable sheath. From eight to ten feet the readings are again taken, and, when proceeding carefully, the troublesome spot may be located almost to the foot.

Very seldom the distances of the manholes are equal. Then the data cannot be platted directly. If e. g. the distance H3 to H4 is 80 feet, and H4 to H5 is 120 feet, the readings V 3-4 would be only two-thirds of V 4-5 for the same current. If, therefore, the distances are unequal, the readings of the shorter cable may be multiplied by the inverse ratio of the distances of the manholes. A change of cross section of the cables also necessitates a reduction of the readings to the same ideal cross section. The calculation of the amperes is based on Ohm's law. The voltage we know from the readings taken. The resistance of the cable sheaths we will have to find yet.

It is the question whether the sheath resistance must be directly measured, or if it can be calculated. Experi-

### RESISTANCE OF LEADSHEATH

MEAN DIA- METER IN.	THICKNESS IN.	CIRCUMFER- ENCE IN IN.	CROSS SEC- TION SQ. IN.	RESISTANCE PER FOOT
1	1/8	3.14	.39	.000298
1 1/4	..	3.92	.49	.000236
1 1/2	..	4.71	.59	.000197
1 3/4	..	5.5	.68	.000171
2	..	6.28	.78	.000149
2 1/4	..	7.1	.89	.000130
2 1/2	..	7.85	.98	.000180
2 3/4	..	8.63	1.07	.000108
3	..	9.42	1.18	.000098
3 1/2	..	10.9	1.36	.000085
1	1/8	3.14	.59	.000197
1 1/2	..	4.71	.88	.000132
2	..	6.28	1.17	.0001
2 1/2	..	7.85	1.47	.000079
3	..	9.42	1.76	.000066
3 1/2	..	10.9	2.04	.000057

ence has shown to the writer that it is exact enough to calculate the resistance of the sheath. The table herewith shown is based upon a conductivity of lead of .000116 ohm per foot and 1 square inch cross section. This is the conductivity of pure lead. Most cable sheaths contain a few per cent. of other metals. Resistance of such alloys may be measured in the office or may be obtained from the cable manufacturer. The first column of the table contains the mean diameter of the cable sheath, the second column, the thickness of the cable sheath, the last column the resistance of sheath per foot length.

The table can be used to find the resistance of almost any cable sheath. For very careful investigation, however, I would recommend to check the calculated resistances by direct measurement of the laid cable after a method described further below.

In Ohm's law we now know the voltage  $V$ , the resistance  $R$ , and the current will be  $C = \frac{V}{R}$ .

There is one difficulty in this method of finding the escaping currents. Suppose in a conduit there are drawn the three cables of 2 1/2 inches diameter and 3-16 thickness of the sheath, and they are bonded at both manholes for some purpose. They must be figured as one conductor with .000026 ohm per foot. If the manhole distance be 100 feet, the resistance will be .0026 ohm. If now a current of one-tenth of an ampere is flowing, the voltage will be  $\frac{1}{10} \times .0026 = .00026$  volt. In other words the voltmeters to be used must be millivoltmeters, or still better even more sensitive instruments. For my own investigations I used so-called pyrometer-voltmeters where 1 degree of the scale was .0001 volt. There are on the market some portable galvanometers which will fully answer the purpose; and very likely the usual Weston voltmeters for 3 and 150 volts may be arranged to be extremely sensitive on application to the manufacturer. It is a good thing if the resistance of the voltmeter is high, so that the resistance of the test wires may be neglected.

This method is a great help to find out who the sinner is. As previously stated, current may get into the cables

from any source. The railroad companies are not the sole trespassers. To lay the blame on the real offender readings are taken at the spot under question at different times, above all at times of very light street car traffic and at times of heavy traffic. The difference of these readings will show whether or not the rails have any influence. If the electric light company is to be suspected, it may be recognized by the steadiness of the cable current. Street car currents jump up and down in periods of about 5 seconds, heavy leaks of lighting mains ought to be very steady.

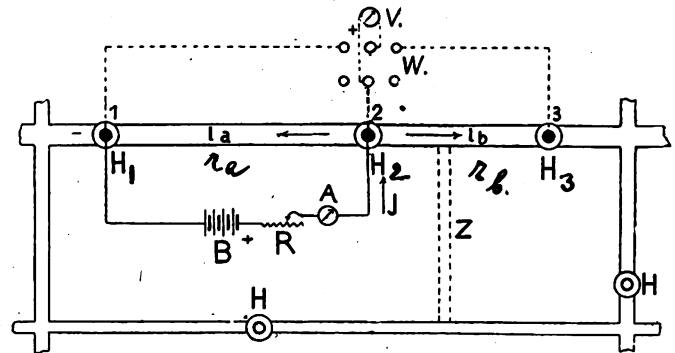


Fig. 8

The measurement of the resistance of a metallic conductor laid in the ground is a somewhat perplexing problem. The following method can be executed with a battery of 10 to 12 dry cells, an ammeter reading from 0 to 5 amperes and a voltmeter reading from 0 to 3 volts in division of tenths of volts. The method can be used only if the metallic conductor is accessible at three points between which no branch is taken off. The branch  $Z$  in Fig. 8 would interfere. The meaning of the indices may be taken from the figure 8;  $E$  means voltage;  $i$  currents;  $r$  resistance;  $L$  length;  $J$  the undivided current indicated by the ammeter  $A$ .

$$\begin{aligned} e &= i \times r \\ a & \quad a \quad a \\ e &= i \times r \\ a & \quad b \quad b \end{aligned}$$

As manhole  $\frac{1}{2}$  the equator for current is

$$J = \frac{i}{a} \times \frac{i}{b}$$

Furthermore there is

$$\begin{aligned} \frac{r}{a} &= \frac{L}{a} \\ \frac{r}{b} &= \frac{L}{b} \\ e & \times L \\ a & \quad a \\ \text{Using the abbreviation sign } n &= \frac{e \times L}{b \times b} \end{aligned}$$

the result is

$$\frac{i}{a} = J \times \frac{n}{n \times 1}$$

and therefore the resistance  $r_a$  which we wish to know,

$$r_a = \frac{1a}{nd} \quad \text{nd } r_b = \frac{ra \times Lb}{La}$$

To check the result I usually switch the battery between  $H_2$  and  $H_3$  and figure it all out again; usually only very slight differences arise.

Concluding our discussion we have to consider the means of preventing damages. Almost universally the cable sheaths are bonded and connected to the rails. Many engineers say they had success, and after bonding the troubles disappeared. In some cases the bonding will

undoubtedly be a great help. It is impossible to discuss that in a general way. The greatest influence upon this consideration is exerted by the surrounding metallic structures. If there are gas and water pipes next to the cables, the bonding may be greatly for the worse instead of for the better. All I can say generally in this case is to investigate the current in the cable sheaths before bonding and after bonding.

## Testing Methods in Telephony. (Concluded.)

BY P. KERR HIGGINS, A. M. I. E. E.

In the previous articles we have considered some of the methods and apparatus used for the regular testing done in telephony, but these tests simply tell us that trouble exists, but do not enable us to determine the location of the trouble.

We found that trouble may be (1) open, (2) partial or complete ground, (3) partial or complete short circuit, (4) partial or complete cross between two circuits, otherwise clear, (5) intermittent trouble.

We further find that trouble in telephony is divided into three main divisions: (1) Switchboard trouble; (2) instrument; (3) connecting wires, either inside or outside, exposed or in cable; (4) electrolysis.

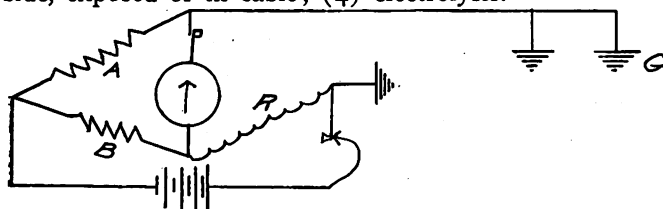


FIG. 1.

By "open" we mean a complete break as against a partial open, which is usually due to a poor joint. The complete and partial break is one of the hardest and most difficult cases of trouble to locate and frequently it is impossible with instruments, in which case it will be necessary to divide up the circuit.

In cables, if the capacity is uniform throughout the entire length of the cable, then the trouble may be located by the "capacity test," explained in a previous chapter, if not, then a test opening should be made at a point near the center of the cable in trouble, some source of alternating current (ringing generator will do) should be applied to the conductor or conductors, then look for it by means of a test needle, which is pushed through the insulation (after the joint has been opened and the core exposed). If unable to locate then the power should be connected to the distant end and the test repeated, the power may be transmitted to the other end over another cable or open wire, care being taken not to get the supply wire, when testing. The trouble will then be located in one-half of the cable; this half is treated in a similar manner until the section is found in which the lost pair or pairs are located.

A joint should always be used for this purpose, and this test should not be made except as a last resort and when the pair or pairs are urgently required. A partial open (as a rule) can only be located in this manner because of its intermittent character which permits of no reliable data or test being made.

Grounds are of two kinds, "dead" or "partial," but unlike opens are easily located, especially on lines and cables.

There are several methods for locating these among which the following are perhaps the most popular. In this connection it is well to note that lines are of two kinds, (1) single, (2) metallic, and the tests are divided in a similar manner. The most difficult one and extremely hard to find is a partial ground on a single line, if no return circuit is available.

For metallic lines the most reliable and accurate tests are (1) the Varley loop test, (2) the Murray loop test.

The breaking down of a high resistance fault (frequently done) by the application of strong reversing currents should only be resorted to when every effort to locate same has failed, because such a practice is liable to produce other faults. It is also well to remember that the positive current is destructive and the negative current curative, and so the latter should be used in every test unless it is desired to make the fault as bad as possible, which is frequently necessary.

In a similar manner the amount of battery to be used may be determined. The positive pole of a battery having the power to deposit copper salts at the fault, the readings obtained are not very reliable if the positive current is used. The depositing of such salts increases the resistance of the fault, the negative current has a tendency to clean the fault and reduce the resistance by throwing off these accumulated salts, if not kept too long, in which case a hydrogen gas is formed also tending to raise the resistance. For this reason all tests should be made and readings taken as quickly as possible.

A little experience in watching the action of both poles of the testing battery will enable the operator to determine the best time to make the test, the reading and the proper manner to manipulate the apparatus to the best advantage.

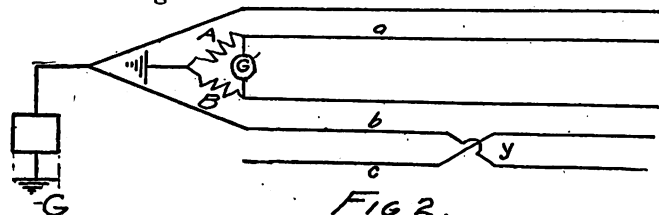


FIG. 2.

The battery used should be of constant voltage and so arranged as to permit the variation of the voltage within defined limits.

The galvanometer to be used (for fine testing) should be dead beat, of the D'Arsonval type, its sensitiveness being in proportion to the fineness of the tests to be made.



In the case of a line (single) having a ground on it the results are not so accurate as in the loop test when a good wire is available, as will be explained later. In order to make a single wire test it is assumed that the resistance of the line (previous to the trouble) is known, or such may be found (nearly) by consulting a table of resistance and finding the resistance per mile of a wire, of the size and material of the wire to be tested, then multiply this by the number of miles representing the line.

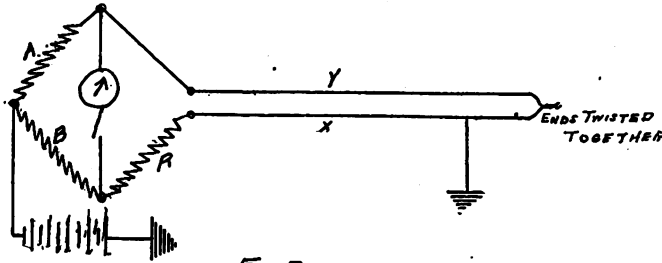


FIG. 3.  
VARLEY TEST.

Call this resistance  $R$ ; now measure the line with the distant line to ground (bridge test for conductor resistance), see Fig. 1. Call this  $A$ ; next make a similar test with distant end insulated (open) and call this  $B$ . Then if  $X$  the resistance the formula would read  $X = \frac{A(B-R)}{B-A}$ , and knowing the resistance per mile of the wire  $X$  is divided by the resistance. It is best to make several tests and take the average as being the nearest correct.

A more complicated test, and more accurate one, can be had by using Blavier's method which is along similar lines to the above. The test may be verified (if convenient) by repeating the test at the other end. Such a test, however, is only practical in cable testing.

In the case of a partial cross between one wire and another the use of the loop test is preferable, except in the case where an extra good wire is not obtainable, in which case the above will apply by grounding one of the crossed wires, and treating the fault as a ground.

Another peculiar case of trouble and one often run into is that due to what is known as a split pair, generally caused by careless cablemen. While the pairs test clear, considerable cross talk is found on placing them in service. A very good test for this trouble is given by Mr. Jameston, and is found to give very good, though not exact results. This, however, serves the purpose as the trouble is always in a splice.

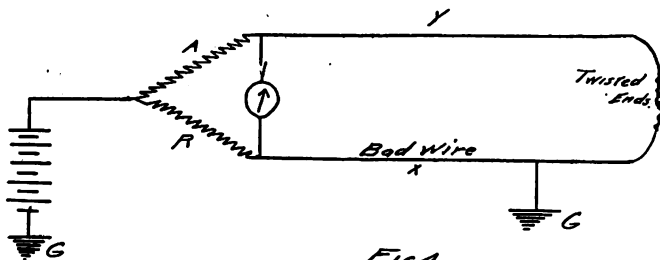


FIG. 4  
MURRAY TEST.

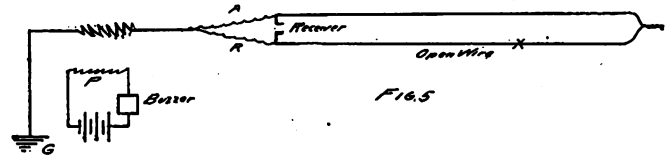
In Fig. 2  $A$  is a good pair;  $B$  is the pair under test, one side of which is transposed with pair  $C$  at the point  $Y$ . Two sides of the bridge  $A$  and  $B$  are used and connected as shown, these being capable of variation in known resistance, a galvanometer or head phone may be used to indicate when a balance has been struck.  $P$  is a source of

interrupted or vibrating current supply connected to ground; the junction points of the bridge arms are also grounded, and all connections completed as shown. When a balance has been struck (no sound in the receiver) then:—

$$\frac{A}{B} = \frac{\text{Length of a in feet.}}{\text{Length of x in feet.}}$$

$$\text{and Length of x in feet} = \frac{Ba \text{ in feet}}{A}$$

The best results are obtainable by repeating the test at both ends where possible to do so.



TEST FOR OPEN WIRE.

Troubles in cables are located in two ways: First, inspection; second, tests. By inspection is meant going over the cable and examining the sheath for cracks, holes, etc., as also the splices. This is a very slow method and not often reliable (as the hole is sometimes very small or none exists, being due to foreign current) and on long cables such practice is seldom resorted to unless no instruments are available. Such an inspection may be made by means of a safety belt or other device such as a small trolley car, the large cumbersome cars are now a thing of the past. Such a car is made in the form of a cable roller, with a wheel on each leg, so arranged that they are on opposite sides with a tendency to remain on the messenger wire being under pressure in that direction, the car thus straddles the messenger wire, with the pulleys running on it, the man pulling himself along as he may require.

If the tests desired are to be accurate, then the delicate testing apparatus is necessary. If, however (as in small plants), a location within, say 50 or 100 feet is sufficient, then the ordinary Wheatstone bridge is all that is necessary.

The more delicate apparatus consists of (1) reflecting galvanometer and shunt box, (2) Wheatstone bridge.

Two standard methods are in common practice today and where accuracy is required, the writer has found it good practice to use both. They are both loop tests, and only such tests are accurate in the location of trouble. The loop is made up of one good wire and the bad wire and the best conditions are when both wires are of the same conductor resistance. Under such conditions the resistance of the fault does not enter into the calculation.

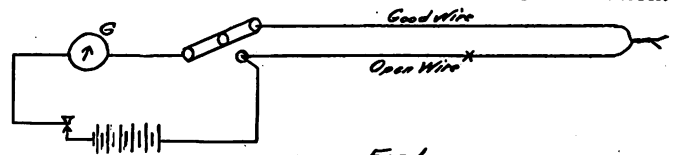


FIG. 6  
TEST FOR OPEN WIRE.

It is well to note at this time that if any multiple taps exist the fault will appear to be at the point where the branch joins the main cable, and another test will, of course, have to be made by clearing the bridge of the former test and making up a new loop from the point of test to the end of the branch on which the trouble showed itself. The same good wire may be used if available on

the branch, if not another may be substituted for it.

**Varley Loop Test.** The connections for this test are shown in Fig. 3, and the same test would apply for crossed wires, with or without resistance at the point of cross, by grounding one of the crossed wires and treating the fault as a ground. The bridge is worked in the usual manner, only being careful to properly locate the bad wire as shown, otherwise the measurement obtained would be the distance in ohms from the distant end, which fact is often used as a check by reversing the wires. In this test  $L$  represents the length of the loop in ohms, which, if not known, must be obtained in the usual manner for straight ohmic resistance.

In the arms  $A$  and  $B$  the 100 ohms is unplugged and a balance struck on  $R$ , the variable resistance arm of the

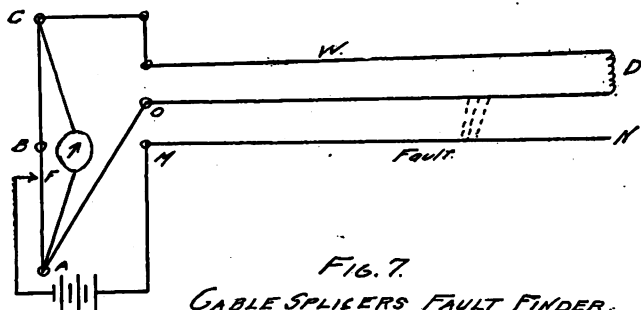


FIG. 7.  
CABLE SPLICERS FAULT FINDER.

bridge. The result would then be  $X$  (ohms to fault) =  $\frac{L-R}{2}$  and the result divided by the resistance per mile would give the distance to fault.

Another method is to use one arm of the bridge only with the variable resistance or Rheostat arm and plug the other up, in which case the formula would be: If the 1,000 ohms is unplugged in  $A$  ( $B$  being plugged up or cut out) then  $X = L \frac{1000}{1000+R}$ .

**Murray Loop Test.** Connection as shown in Fig. 4. In this test the exact distance in feet from the testing point to end of cable must be known. Same conditions are established as before, except that we only use  $B$  and  $R$ . Now unplug 1,000 in  $B$  and balance as before, then the formula is  $\frac{B \times \text{twice length of cable}}{B+R} = \text{distance to fault}$ .

The reverse of this acts as a proof (as before), giving you the distance in feet to junction of bad and good wire or end of cable and back over bad wire to fault as in Varley test.

If the fault is apparently close to testing point use 10 or 100 instead of 1,000. Test for open lines may be made in a similar manner by the addition of a buzzer or vibrator, as shown in Fig. 5. Use a receiver instead of galvanometer for the balance indicator and the same formula as in the Murray test.

In testing it is frequently found that battery is flowing from the fault and is often as strong as the testing battery. In such cases use a stronger battery or reverse the polarity, the former preferred, as the counter E M F is, as a rule, very variable and thus unreliable. Experience with such faults is the only sure means for successfully handling them as seldom do the conditions appear alike while still having much in common, which act as finger posts to the experienced tester.

The second test given under Varley test is found good for such cases.

In the case of a cross pure and simple, that is with

no ground, another method of testing is to use the Varley test, taking the ground off the battery and connecting the battery end (formerly grounded) to the crossed wire and treating the other crossed wire as though a ground and proceeding as before, using same formula. The value of  $X$  (end from test point) should be at least one-tenth of  $Y$  (test from distant end) to obtain best results, otherwise a very fine balance is necessary on the bridge.

In measuring resistance, etc., it is of the utmost importance that proper ratios exist in the arms of the bridge, and the following arrangements are suggested:

RESISTANCE UNDER MEASUREMENT	A	B
LESS THAN 1.5 ohms.....	1000	1
1.5 to 10 ohms.....	100	1
10 to 100.....	100	10
100 to 1000.....	1000	100
1000 to 6000.....	100	100
110,100 to 1,110,000.....	10	1000
Above.....	1	1000

Another method for locating an open wire is by connecting up a loop as in the Varley and Murray tests, a key, galvanometer, switch and battery, as shown in Fig. 6. Take a reading first on bad wire and call it  $A$ . Then on good wire and call it  $B$ . Then connect both together and take a reading and call it  $C$ . Now let  $L$  = length of cable in feet, as in Murray test, and  $X$  = length in feet to break from testing end, and then we

have:  $X : L :: BL : C - B + B$  or  $X = \frac{LA}{C - A + B} = \text{distance in feet}$ .

If insulation test shows open less than one and a half megohms the above cannot be relied upon, and the loop test should be made.

A very simple testing apparatus named the "Cable Splicer's Fault Finder," and in use in the United Telephone & Telegraph Company, of Philadelphia, is worthy of consideration and notice, filling as it does a long felt want, in that it is simple and efficient and gives results without any complicated mathematics and so can be used by men ignorant of Wheatstone Bridge methods. The skeleton of this apparatus is shown in Fig. 7, and the detail in Fig. 8. These diagrams almost explain themselves.

In Fig. 7  $AB$  represents a resistance wire stretched

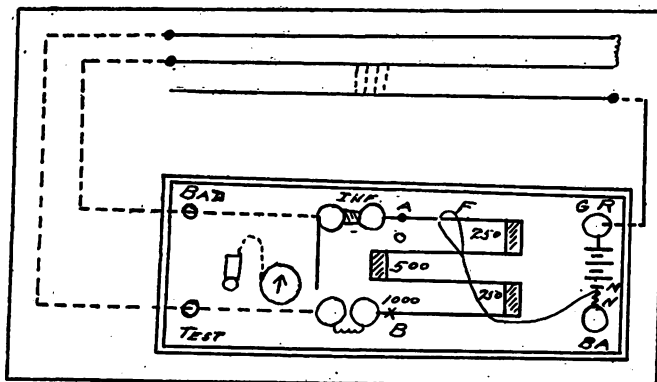


FIG. 8 DETAIL OF FAULT FINDER

over a scale of 1,000 divisions and  $BC$  a wire in series

with it of equal resistance and length; OD represents a telephone wire crossed with another wire; MN and CD is a good wire of equal resistance to OD and parallel with it. The connections are made up as shown on the diagram, the point F being a sliding contact along AB. The distance A to F will be the same proportion of total distance AB as the distance from A to G is of total distance AD. Hence, if AD is known, the distance to G may be determined by the position of F on AB. If 250, then distance to G is  $\frac{250}{1000}$  of the distance AD, and if AD=10 miles, AG= $\frac{250}{10}$  of ten miles. In the case of a ground the battery connection is taken off M and connected to ground, the battery will be regulated according to

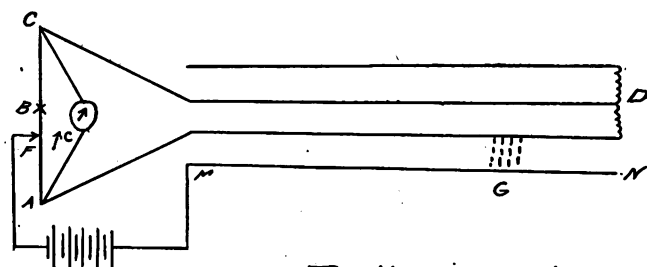


FIG 9. TEST UNBALANCED WIRES.

the needs, using no larger voltage than necessary to obtain a good reading. This apparatus lends itself readily to a large number of tests and is very serviceable. The reading at F being the only reference required the formula being  $\frac{\text{Reading at F} \times \text{total distance in feet}}{1000} =$

distance to fault. In a case where no parallel good wire of equal resistance is to be had connect up as in Figs 9 and 10. Take reading as connected in Fig. 10, then as in Fig. 9, then formula would be distance to fault

$$\frac{\text{Reading Fig. 9}}{\text{Reading Fig. 10}} = X \text{ distance in feet.}$$

Trouble due to electrolysis shown by the cable sheath being honeycombed or pitted can be overcome by placing the system in an electro-negative condition with reference to the earth, then bond all cables and connect to return (not rails) at power station.

The entire system should be tested carefully and all electro positive conditions removed making the connec-

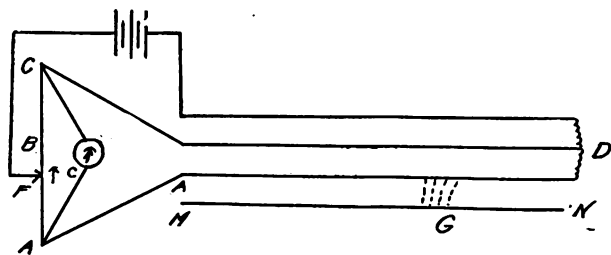


FIG 10 TEST WITH UNBALANCED WIRES.

tion to the return at power house with the section which is electro positive.

The following table is given as a convenient reference for wire chiefs and others:

## Resistance of Pure Copper Wire—B &amp; S Gauge.

B & S Size	Fee Per Ohm	Diameter in Inches	S. P. G. R. 8-90 Lbs. Per Foot	Feet Per Pound	Ohms Per Foot
4-0	20383.	.460	.6405	1.561	.0004893
3-0	16165.	.4096	.5080	1.969	.0006170
2-0	12822.	.3648	.4028	2.482	.0007780
1	10166.	.3249	.3195	3.130	.0009811
0	8062.3	.2893	.2533	3.947	.001237
2	6393.7	.2576	.2009	4.977	.001560
3	5070.2	.2294	.1593	6.276	.001967
4	4021.0	.2043	.1284	7.914	.002480
5	3188.7	.1819	.1002	9.980	.003128
6	2528.7	.1620	.07946	12.58	.003944
7	2005.2	.1443	.06302	15.87	.004973
8	1590.3	.1285	.04998	20.01	.006271
9	1261.3	.1144	.03963	25.23	.007908
10	1000.	.1019	.03143	31.82	.009972
11	793.18	.09074	.02493	40.12	.01257
12	629.02	.08081	.01977	50.59	.01586
13	498.83	.07196	.01568	63.79	.01999
14	395.60	.06408	.01243	80.44	.02521
15	321.02	.05707	.009858	101.4	.03179
16	248.81	.05082	.007818	127.0	.04009
17	197.30	.04526	.006200	161.3	.05055
18	156.47	.04030	.004917	203.4	.06374
19	123.99	.03589	.003899	256.7	.08038
20	98.401	.03196	.003092	323.4	.01014
21	78.087	.02846	.002452	407.8	.01278
22	61.911	.02535	.001945	514.2	.01612
23	49.087	.02257	.001542	648.4	.02032
24	38.918	.02010	.001223	817.6	.02563
25	30.864	.01790	.0009699	1031.	.03231
26	24.469	.01594	.0007692	1300.	.04075
27	19.410	.0142	.0006100	1639.	.05138
28	15.393	.01264	.0004837	2067.	.06479
29	12.207	.01126	.0003836	2607.	.08170
30	9.6812	.01003	.0003042	3287.	.1030
31	7.8573	.008928	.0002413	4145.	.1299
32	6.0680	.007950	.0001913	5227.	.1638
33	4.8290	.007080	.0001517	6591.	.2066
34	3.8281	.006305	.0001203	8311.	.2605
35	3.0863	.005615	.00009548	10480.	.3284
36	2.4082	.005000	.00007568	13210.	.4142
37	1.9093	.004453	.00006001	16600.	.5232
38	1.5143	.003965	.00004759	21010.	.6585
39	1.2012	.003531	.00003774	26500.	.8304
40	.9527	.003145	.00002993	33410.	1.047

Resistance varies slightly at different temperature; above table at 20 degrees Centigrade.

NOTE—E L S Gauge is two sizes higher than B & S Gauge. N B S Gauge is two sizes higher than B & S Gauge.

The annual convention of the Nebraska Independent Telephone Association will be held at Lincoln, Neb., January 23 and 24, at the Lindell Hotel. An enthusiastic and well attended meeting is expected.

The West Virginia Independent Telephone Association will hold its annual meeting at the Chancellor Hotel, Parkersburg, W. Va., on February 22 and 23. A full attendance of the Independent telephone men of the state is desired and expected. The secretary of the association is A. C. Davis, Bastable building, Parkersburg, W. Va., who will be pleased to furnish all information which may be desired.

The Pioneer Telephone & Telegraph Company, Oklahoma City, O. T., is installing a complete cable plant at Tulsa, Medford and Shawnee, I. T. All their toll lines are being rebuilt. The company will begin the erection of a five story building about February 1, to cost \$135,000, at Oklahoma City. The cabling of the city is well under way. The population of Oklahoma City has doubled in the past five years and is still rapidly increasing. When the two territories are made into one state the development will be phenomenal, as the drawbacks now existing will be remedied by proper state laws.

Stromberg-Carlson Tele. Mfg. Co., Rochester, N. Y., report having closed contracts for switchboards for the following places: Varna, Ill.; Vrich, Mo.; Bouton, Ia.; Atalissa, Ia.; Leonard, Mich.; Stuttgart, Kan.; Stromburg, Nebr.; Stephensport, Ky.; Yates City, Ill.

# Cross Talk on Telephone Lines

W. A. TAYLOR

The cross talk between parallel lines is that which bothers lineman more than anything else, especially when the lines are grounded. The reason for this cross talk or induction has frequently been explained in these columns, but inquiries about it are so frequent that the following explanations may be welcome:

There are two ways by which cross talk may be affected by electro-magnetic induction and electro-static induction.

## ELECTRO-MAGNETIC INDUCTION.

It is well known that when a current passes through a conductor, there will be lines of magnetic force surrounding it. These lines extend out into space for a

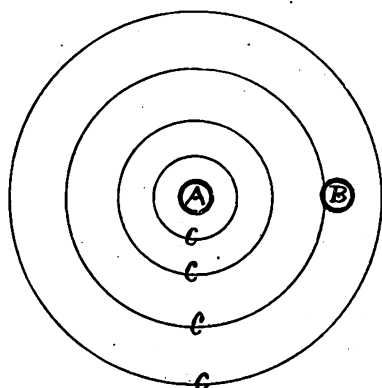


Fig. 5.

great distance. Theoretically these lines extend to an almost infinite distance. It is very much the same as dropping a stone into a pool of water. There are radiating waves of water which extend to all parts of the pool. These waves have less force as they increase in distance from the source. It is just so with the magnetic lines of force.

In figure 5, suppose that A represents the cross section of a wire through which a current of electricity is flowing. This current causes the lines of force C, C, C, C, which extend into the surrounding medium regardless of whether it is air or other insulating matter.

We have learned that if a conductor is surrounded by such a magnetic field there will be a current induced into it every time there is an increase or decrease in the strength of this field. Suppose that B represents the cross section of another conductor that is parallel to A. The lines of force will then surround conductor B and every time there is a change in the current strength of the circuit through A there will be a similar change in the current in B. Thus it will be understood that if the current in A is that of a telephonic nature there must also be a similar current in B, hence the cross talk. The current in the one conductor is always opposite that which is in the other. It is seen then that there must always be a considerable amount of trouble from cross talk between two single wires that run parallel. That is the reason that grounded lines always give so much trouble of that kind.

Suppose that we take the case where there are two metallic circuits running parallel to each other.

In figure 6, let A and B represent the two wires in one circuit and C and D the two wires in the other circuit. If a current is flowing in A B, each wire will be surrounded by lines of force; the lines about one wire being in opposite direction to those about the other. There will then be a tendency for the lines of one wire to neutralize those of the other. The lines of force around B will have a greater effect upon C than upon D, consequently the current induced in C will more than counteract that induced in D. As B is nearer to C and D than A is, it must have a greater effect upon them and consequently there will be induction from one circuit to the other.

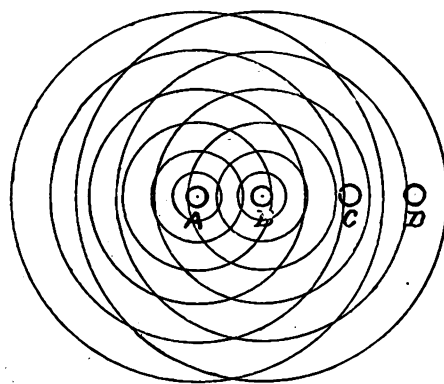


Fig. 6.

If, then, some method cannot be adopted that will prevent this cross talk, it will be impossible to use more than one circuit at a time over wires that are of much length.

There is another cross talk trouble that is even worse than the electro-magnetic, and that is the electro-static cross talk. As both kinds are cured by the same remedy, it will be better to explain how this latter trouble acts.

## ELECTRO-STATIC INDUCTION.

Suppose there are two parallel conductors, A and B, running close together (Figure 7). If conductor A is

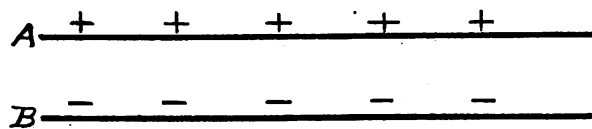


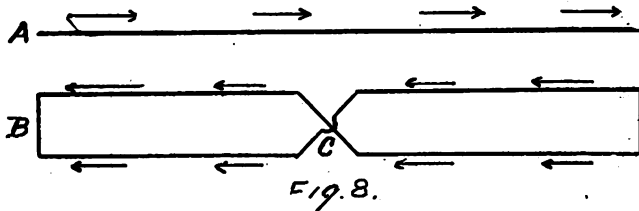
Fig. 7.

charged with a positive current, the one parallel to it will be charged negatively. Then when A is charged there will be a rush of negative current in the part of the parallel circuit nearest to it. Then when A is charged oppositely the negative charge in B will be reversed. If the charging of A is done by a telephonic current, then the pulsations in B will be exactly similar to those in A. It would be just the same if both circuits were metallic, but the trouble would be somewhat less just as it is in



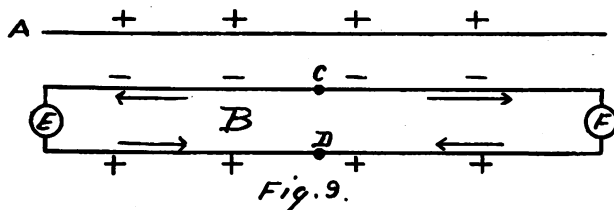
electro-magnetic induction, because of the counteracting action of one wire of the pair upon the other.

Now how is this trouble to be avoided? In the case of grounded circuit the trouble may be diminished, but not cured. The only way to help such circuits is to separate them as far as possible. As the effect decreases as the circuits are separated, the cross talk will be re-



duced also. It is best not to run parallel grounded lines over considerable distances, and when it is necessary to parallel circuits, they should be metallic.

With metallic circuits the cross talk may be entirely removed by a system of transpositions. There are lines in this country fifteen hundred miles in length and there is not a particle of cross talk. This is due to scientific



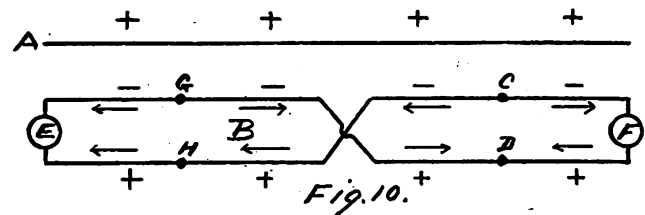
transpositions and to high grade insulation. If the lines are not well insulated there can be no good effect obtained.

In figure 8 are shown two circuits, A and B. In A a current is passed. This current has an inductive effect upon B. B is transposed at C. The current in A flows

A. By following the direction of the arrows it is seen that, so far as the electro-magnetic induction is concerned, there can be no cross talk. The results would be the same if both circuits should be metallic.

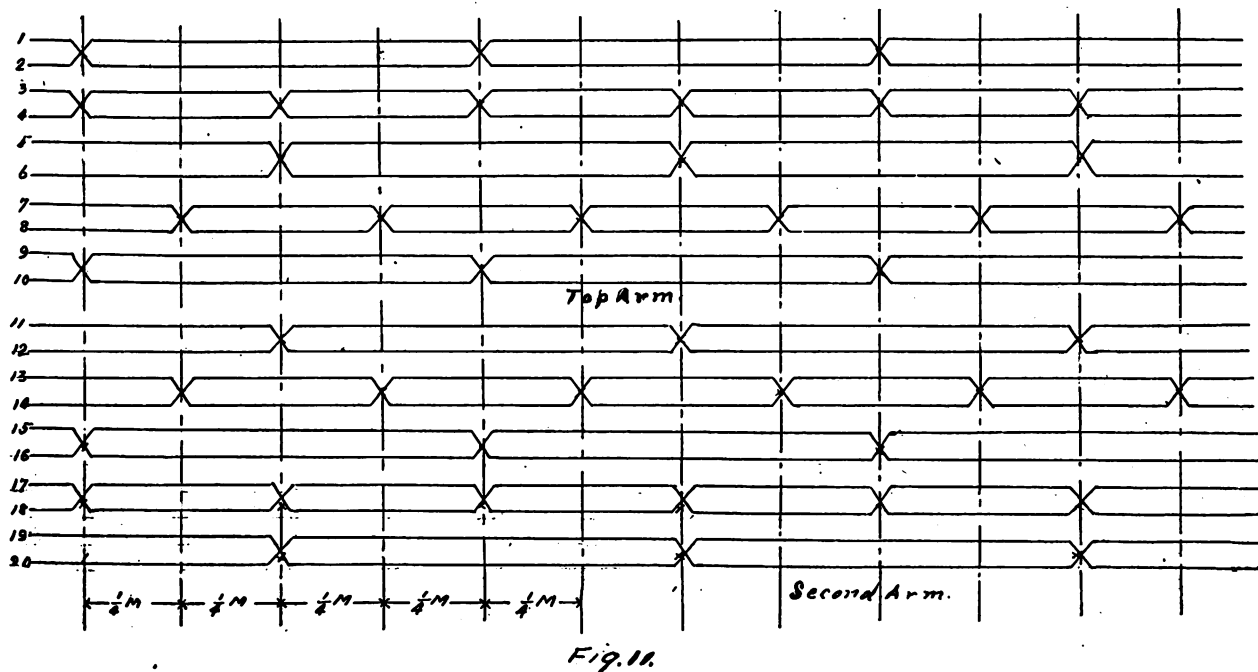
It is an easy matter to provide for the transpositions of the circuits for electro-magnetic induction or cross talk, but there is needed considerably more skill to provide for the static induction. There are problems arising from this trouble that puzzle the most skillful.

In figure 9 there are two circuits, A and B. The circuit A is the one which carries the disturbing current. Suppose that A is charged positively. Then the near side of B will be charged negatively and the far side positively. A change in the polarity of A will cause a redistribution of the charge in B, charging the near side



positively and the other side negatively. When this change occurs there must be a flow of current from one side to the other through the telephones E and F. When this happens there will be a noise heard in the receivers. If both telephones are of equal resistance, it is evident that each will carry an equal amount of current. In the change of polarity, the current must travel in both directions from the point C to the point D. There will be no current at these two points C and D and if a telephone is connected at these points no sound will be heard. The points C and D might be called neutral points.

If a transposition is placed at the point K in the center of the circuit B, as shown in figure 10, there will be a



to the right, and the induced current in B tends to flow to the left. The transposition in B is in the center so that both sides of the circuit average equal distance from

similar condition to that in figure 9. In each half of the circuit there will be two neutral points, GH and CD, at which there will be no current. The arrows indicate the

direction in which the current flows when the change in polarity occurs. The transposition point is not a neutral point, neither are the telephones at a neutral point. The portion of the circuit between the neutral points, CD and GH, carries a current that exactly neutralizes that which flows in the parts between the neutral points and the telephones. So it is seen that the telephones are affected by a small portion of the unbalancing current. In fact while there will never be a complete balance, the induction may be reduced to a very small amount by increasing the number of transpositions indefinitely. As the transpositions in ordinary long distance work are seldom more than one-half mile apart, it is seen that the unbalanced part of the circuit is not more than half that length.

Where the line which causes the trouble is an electric light circuit and when the telephone line is very near, the transpositions must be placed much closer together. Sometimes they are placed at every pole. In cables where the wires must be very close together each circuit is twisted so there is a transposition every three inches.

So it is seen that the method of transposing will remedy the cross talk whether caused by electro-magnetic or by electro-static induction. One transposition placed

in the middle of the circuit will effectually prevent the cross talk from magnetic induction, but there needs to be many of them to prevent static induction. So it is that the magnetic induction will be taken care of incidentally if the electro-static induction is taken care of.

It needs quite an ingenious arrangement of the wires to prevent cross talk when there are a number of circuits involved. It will not do to have all of the transpositions at the same points along the lines, for then there will be no transpositions with respect to each other. For instance, take but two circuits: If one of them is transposed every half mile, the other must be transposed at the same points and also half way between. When there are a large number of circuits there is quite a complicated arrangement.

Figure 11 represents the transposition as worked out by the engineers of the American Telephone & Telegraph Company. The arrangement is for two ten pin cross arms. When more than that number of arms are used, the scheme is repeated.

This arrangement for transposing works very well over distances of fifteen hundred miles, or the longest lines in the world.

[THE END.]

## Telephone Troubles

BY H. P. CLAUSEN.

Every person who has had anything to do with the operation and maintenance of telephone apparatus knows what telephone troubles are. That is to say, telephone and switchboard apparatus is as likely to develop faults as any other piece of mechanical apparatus, whether it is purely of a mechanical nature, or of an electrical character.

In the well organized and properly equipped maintenance department of a telephone company, troubles which develop from day to day are usually taken care of by the employees of the company, without calling for outside assistance or advice. However, it is not every exchange manager that can afford to employ a trouble man who is capable of locating difficulties which come up and which do not show on the face of it just what is wrong. Generally, circuit troubles are the most difficult ones to handle.

Given an exchange equipment consisting of several positions of switchboard, let us discuss some of the different troubles that generally come up, and, as a rule, call for advice from the manufacturer of the apparatus.

It should be understood that the writer does not wish to make this a treatise on telephone troubles, but simply draw attention to a number of the most frequent cases which every correspondent in the engineering department of manufacturing companies has brought to his attention and is required to render his advice upon, possibly two or three times a week, or perhaps even oftener. In fact, it is a practice to send out a form letter in answer to certain cases of trouble. Of course there are some books published which are intended to serve as a guide to the less experienced telephone worker towards locating difficulties, but telephone troubles appear to have a peculiar way of "show-

ing up" and when a man knows enough to locate the trouble and correct it according to "the book" he generally knows enough about telephone troubles so that he does not need the book to clear certain difficulties.

One of the most common cases where an exchange is operated upon a common return or grounded basis consists in the common return wire being connected to the wrong side of the line. i. e., the common return or ground wire will be connected to both the tip and sleeve wires of different line jacks. Say line No. 1 has the tip wire connected to ground, and then line No. 2 the sleeve wire to ground, and so on throughout the entire switchboard. Now if it is understood that the board has been connected up and the telephone company is ready to give service and they commence to operate the switchboard, then no one can blame the new telephone man for getting a telegram off to the maker of the switchboard asking him to immediately send an expert to straighten out their troubles. What makes this case of line reversal very mysterious to some people, is the fact that they can connect together certain lines and obtain good service, but they do not know that when, say line No. 1 and line No. 2 are connected together that both subscriber No. 1 and No. 2 are "talking into the earth," so to speak, for the sleeve wire of line No. 1 has been connected to the sleeve side of the cord circuit through to the sleeve side of line No. 2, and thus led line No. 1 directly into the common return, or earth. The same being true of line No. 2. In other words, the result of this reversal is all the more mystifying because sometimes line No. 1 works fine because it is connected to a line in the board which happens to have the same side of the spring jack grounded. Of course, when such cases come up, it is easy to straighten out the difficulty when you get at

the nature of the complaint. It is sufficient, as a rule, for the trouble correspondent to learn that the switchboard trouble is of a character in which some lines can be connected with other lines and work fine, while at other times the circuit will not work at all.

This matter of line reversal is not always the only instance where certain lines cannot be connected together and the same lines can be connected with other lines and give good service. This refers to cord reversal. When a switchboard has been installed, and it becomes necessary to rebutt cords, then the man who has not had the same "case" before is quite likely to connect the tip of the answering cord to the sleeve circuit of the calling cord, with the result that when this particular cord circuit is used then the lines which are connected together through it, are "dead." And when we add to this the fact that certain lines in the switchboard are operated upon the metallic plan, while the remaining lines operate either common return or ground or grounded, then it is easy to find a reasonable excuse for the switchboard man's statement that there is something wrong with the switchboard, for when lines are connected together, sometimes they will work and sometimes they will not work. The cause of this mystification lying, of course, in that when the when the metallic line is connected together with another metallic line with this reversed cord circuit, no trouble is experienced. Further, the metallic line can be connected with a grounded line without any trouble being experienced, but when a grounded line is connected together with a grounded line, then "there is trouble." The reader may suggest that this case is easy, because he knows now that a cord has been reversed, that is, a tip has been connected to a sleeve of the same pair and that he would have straightened out the difficulty right quick, but how did the switchboard man know that this particular cord circuit was giving him trouble, and unless he knew it beforehand how could he tell that it was a case of cord circuit trouble? What makes a case of this kind very difficult for the inexperienced is that it works sometimes (to use an expression frequently heard) and does not work at other times. That is, it "comes and goes."

Speaking about reversal we may include a case which generally comes up when two boards are connected together. Suppose one position of switchboards has been used and everything works along nicely, and a second position is added. As a rule, the new switchboard man has been "up against" the tip and sleeve as well as cord reversals and knows by experience what to do in such cases. Now, say, he has added a pole changer or something of the kind, for giving him ringing current, then the chances are equal for his connecting the generator terminals on the two switchboards together in a reversed direction, with the result that when operator A and operator B ring out over lines upon their switchboard, there is trouble, for the simple reason that the side of the generator which connects to the grounded side of the ringing key in the first position, does not connect to the grounded side of the ringing key in the second position by reason of the generator wire reversal, with the result that while operator A rings out, the number 1 side of the generator is connected to ground, and while operator B rings out, a ground is placed upon the No. 2 side of the generator, consequently, neither operator succeeds in raising the subscriber and owing to this case showing

up sometime, and coming and going, so to speak, it adds another case to the credit of the telephone man's experience. And the same case will not again cause him trouble.

One of the most discouraging communications a manufacturing company frequently receives (and usually from customers 500 or more miles away) runs about as follows:

"Telegram.—Send man at once. Board gone dead."

Now there may be a dozen different cases of trouble which call for this form of communication. A receiver cord may be broken, a transmitter cord may be broken, there may have been a failure in properly connecting the common return wires, or it may be a case similar to one experienced not many years ago, happily but no longer very common, where when the expert, arrived, he found that the batteries intended for the transmitter supply circuit had been connected to the generator terminals of the keys and thus prevented any possibility of ringing out over the line, and in an endeavor to fix up the trouble, the batteries intended for the night alarm circuit had been connected to the operator's selector terminals. Of course, the board certainly was "dead," excepting that the subscribers' could ring the drops down. The lineman who installed the board had done as well as he knew how. His lines were properly connected and he proved there was battery somewhere for when he opened and closed the battery wire connecting to the operator's selector circuit, or worked the listening key, he heard a click, and while he did not understand what to do with "those two terminals" connected to the wires coming from the transmitter, he had every reason in the world for calling in the manufacturing company's expert, who, it is needless to say, quickly brought the board "to life."

The writer does not wish to belittle the inexperienced man's efforts, but merely gives the foregoing experience as a case which actually happened, and simply showing that such things must be experienced before one thoroughly appreciates the difficulties of handling telephone troubles, from a distance by correspondence, and gives such advice as may permit of the difficulty being straightened out without sending an expert hundreds of miles to straighten out a simple case of trouble.

(To be concluded.)

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Not long ago the Missouri & Kansas Telephone Company (Bell) bought up four or five telephone exchanges in Missouri, including those at Kirksville, Carrollton, Trenton, Brookfield, and half of the Richmond plant, together with a few smaller ones. Then an article, supposed to have originated in Chillicothe, Mo., whose exchange would not sell to the Bell, came out in several county papers, saying that the Bell company had caused consternation in the ranks of the Independent telephone exchanges and was about to cause a panic among them.

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The city council of Kirksville, Mo., has granted a franchise for twenty years to Mathew Muldoon, who will put in an up-to-date Independent exchange, which will fill in and make a complete and unbroken Independent line from St. Louis to Des Moines, Iowa.

# Mechanical Transmission of Sound

A. E. DOBBS

## PRELIMINARY.

The desirability of communicating at a great distance instantaneously has ever been striven for by mankind even from the most primitive times, and of all the means used the transmission of speech or at least sound, has been the favorite method prior to the discovery of the electric telegraph and telephone, neither of which, by the way, transmit sound, but only electrical impulses or waves which at the receiving end are retransformed into sound.

Strictly speaking, telephony is the art of conveying sound to a distance, or rather the receiving of audible signals, whether by electrical impulses as in the familiar electro-magnetic instrument, by a code of drum beats sent to a receiving drum, as in the Congo region, or by trumpet signals as in war. It may also surprise some telegraph operators to learn that the operator who reads messages from his sounder is really a telephonist, but such is the case; but as Morse recorded all of his messages on a tape he correctly named his instrument the telegraph instead of the telephone. The term telegraph is properly applied only to those instruments which leave a permanent record (the word means far writing), but, as the term originally seems to have been applied to instruments of the semaphore class, it has come to be applied to all methods of visual signalling or writing.

Sound possesses the advantage of working through a fog or in the dark, but likewise the disadvantage of giving

the hull of a ship beneath the surface of the water is extremely sensitive to vibrations so that it has now been found possible by merely fastening a sensitive diaphragm—or a telephone transmitter—to the hull to receive “tapping signals” for quite a long distance from a ship similarly equipped. It may seem strange that the hull of a 1,000 ton, or larger, vessel should be so responsive, but when we consider that we have a pressure of 1,000 tons of an extremely elastic fluid distributed over every part of the submerged hull it is not so strange after all.

Now it so happens that in the valleys of both the Congo and the Amazon a dense tropical growth prevents



FIG 2 SCHOOLBOY'S TELEPHONE.

the transmission of sound signals through the air to any great distance, but both these valleys have a soil underlaid with an elastic, spongy clay, or gumbo, which will act as a good conducting medium of sound vibration, hence a drum buried in this soil at one end and forcibly struck at the projecting end will transmit these waves a long distance so that a person listening with his ear to the diaphragm of a similar drum in another village can hear and, with his drum stick, answer the signals without difficulty. A ledge of rock lying between the villages would of course prevent these signals being transmitted, but that is not a contingency to be reckoned with in these localities. Two drums, with their lower ends resting in the same subterranean vein of water, should be able to signal even over rocky ledges. Such a means of transmission is, of course, confined only to news of the most general character, for as these natives have no written language they must, of course, rely upon a purely arbitrary code, but that it is effective seems to be proved by the fact that important news in these regions seems to travel days faster than the swiftest couriers.

The earliest record we have of trumpet signalling is found in the second book of Samuel, xv. 10, as follows:

“But Absalom sent spies throughout all the tribes of Israel, saying. As soon as ye hear the sound of the trumpet, then ye shall say, Absalom reigneth in Hebron.”

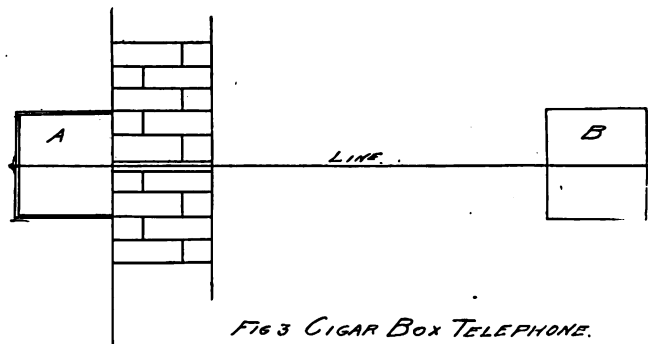


FIG 3 CIGAR BOX TELEPHONE.

These trumpeters being placed within hearing distance of each other on high hills or towers undoubtedly transmitted the news of Absalom's coup over a section of country the size of Illinois within an hour or so, and

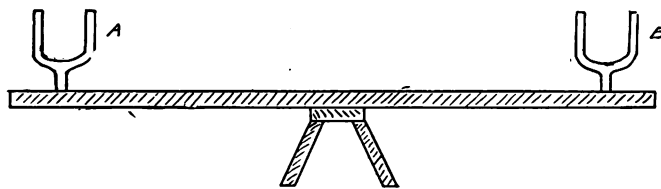


FIG 1 VIBRATIONS TRANSMITTED THROUGH A PLANK.

information to others than those for whom the message is intended. Along the course of streams or in deep valleys, when conditions are favorable, it might be possible for a lusty lunged individual to make himself heard to a distance of five or six miles while under ordinary circumstances from one to two miles is the utmost range. Longer ranges than this are sometimes necessary, however, and savages soon found out that signals made on a large drum gave a much wider range of communication, while travelers from the Congo, as well as from the Amazon regions, have frequently reported that inter-village messages are often tapped out on a large drum, the body of which is buried in the earth.

## DRUM TRANSMISSION.

This by the way, requires an explanation not vouchsafed by the travelers aforesaid, and, so far as the writer knows, by no one else.

If two tuning forks of the same pitch as A, and B, (Fig. 1) be placed on a plank supported near the center, and the fork A, struck and held firmly against the board, then the fork B will likewise be set in motion by the vibrations transmitted through the plank and also give forth a sound. In a similar manner it has been found that



that the scheme was effective was shown by the fact that within a remarkably short time two armies whose combined strength must have approximated, at least, 100,000 men took the field. From the apparently frictionless working of this method of signaling it seems to have been a more or less familiar one.

#### TELEGRAPHIC METHODS.

The most primitive telegraphic methods is probably the smoke signaling of the various Indian tribes where by means of light or dark smoke, made by burning different woods or leaves, or by so arranging the fire as to make the smoke rise in puffs, quite a variety of intelligible signals can be transmitted.

Perhaps equal in point of antiquity is signaling by means of flags, which has been in use as long as commercial navigation or systematically organized armies.

Related to the flag signaling and antedating the electro magnetic telegraph by many years, were the semaphore telegraphs, of European invention, which consisted of arms mounted upon a high pole or tower which, being moved up or down, the same as railway block semaphores, enabled signals to be read for a distance of several miles. When it was desired to send communications from one city to another, the sending operator would "call" his nearest neighbor by raising the arm and leaving it up until his call was answered; being answered he would then spell out the message by moving the arms up and down while his nearest neighbor would repeat his signals further on till the message reached its destination. At the time Morse constructed his first telegraph line Congress was seriously considering the establishment of a

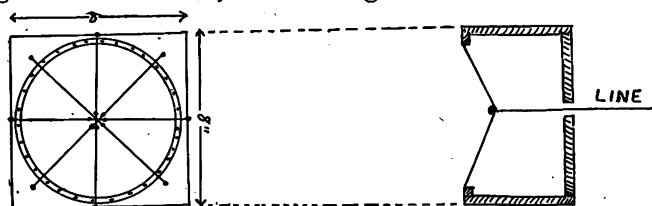


FIG. 4. FRONT AND SIDE VIEW.

line of semaphore stations along the entire Atlantic coast. Of course the success of the Morse system stopped all that.

While on the subject of telegraphs it may be news to some, that Morse did not invent the first electric telegraph, but that a system of needle telegraphs was in use in England for some time previous. This needs but a brief description for it consisted simply of a polarized needle, caused to deflect to the right or left by reversals of the battery which was manipulated by a double key, and this system was continued on some British railways up till within a few years ago.

#### ARTICULATE TELEPHONY.

Properly a speaking tube might also be included in the list of telephonic devices and is probably the most ancient of all. It has been reported by travelers that some of the ancient temples of India were so connected by a speaking tube or some other means, that people who found it necessary to consult the gods, when placed in a certain position, could always receive their answers—provided the priests knew the answer—direct from the god himself. (People who consult the supernatural world must receive some sort of an answer to their fool questions or else the god, or medium, will soon lose his reputation and business go elsewhere). As a three-inch drain tile will convey articulate messages to a distance of a thousand feet, it is

probable that this was the means used for these "heavenly messages," especially, as wire in long lengths was not made to any great extent in those days. Ancient Egyptian and Greek oracles are also full of suggestions of this kind, so, that we may dismiss the speaking tube as fairly ancient and well known to a few at least.

#### WIRE TELEPHONY.

Sometime in the fifteenth century when men began to think of other things than means of plundering each other, someone discovered that if two boxes with a parchment diaphragm were connected by means of a tight wire or waxed string ordinary speaking tones or even whis-pers could be carried much further than usual. An outline of this device is shown in Fig. 2, in which A. B. represent the boxes to which a diaphragm is attached and through the center of which a string or wire passes. With A. speaking and B. listening, a whisper can be heard as far as a hundred feet or so if the string or wire is kept tight. As lovers of those days were kept as far apart as possible, he on the sidewalk, and she in the second story behind barred windows, it is easy to imagine the cormorant-like avidity with which heart hungry cupidites seized upon this device as a medium of communication which they have not relinquished even in these utilitarian times. From this it received the name of whispering or lovers' string—for the name telegraph had not been invented in those days—and possibly explains the origin of the phrase "I've got him on a string." But it seems also to have had considerable use in farm houses and factories.

In its form today, as used by schoolboys, it generally consists of two tin cans with the tops and bottoms removed and one end covered with sheepskin; but, as the tin can absorbs a great deal of the vibration, this is not a very efficient device. A cigar box, with the cover removed, turned upside down and a string fastened to the center and placed against a solid wall is much more efficient, though a cigar box is hardly strong enough to stand the strain of a tight wire for any except short distances. (Fig. 3.)

A very efficient box was constructed in the early eighties which was simply a round box of hard wood, with a diaphragm of hard fibre, with a large button in the center to which the wire was attached. Sometimes a sheet metal diaphragm was substituted for the hard fibre, but this was open to the objection of metallic resonance which was rather disagreeable. This is not the case with wood, hard fibre or parchment. Diaphragms of parchment are, however, the most sensitive and give the most perfect articulation of any, but must be supported at many points in order to stand the strain of the wire. One device made by the writer about 1885 consisted of violin strings brought from side to side over a parchment diaphragm—Fig. 4. This box gave the most perfect articulation he has ever heard over a line of any kind and it was possible to carry on a conversation with several persons sitting or standing near the telephone, for these instruments can be heard over the larger part of an ordinary office. Parchment and gut strings, however, are rather sensitive to changes of the weather, being especially subject to dampness even when covered with shellac, but when the strings in the above case were replaced with a similar spoke wheel support cut in one piece from sheet copper over the diaphragm, a very practical device was obtained which was placed upon the market and achieved considerable success.

Another form experimented with by the writer, and outlined in Fig. 5, was a suggestion borrowed

from violin construction. A large bass viol, for example, is built up of wood of considerable thickness, but owing to its perfect resiliency the heavy strain, and the equal distribution over every part, will respond to the lightest touch even to the most delicate harmonics. From this the author argued that, if a perfectly balanced, wooded front could be constructed, an instrument could be had that would articulate perfectly, allow of a tighter wire and at the same time be independent of weather conditions. The box had hard wood sides

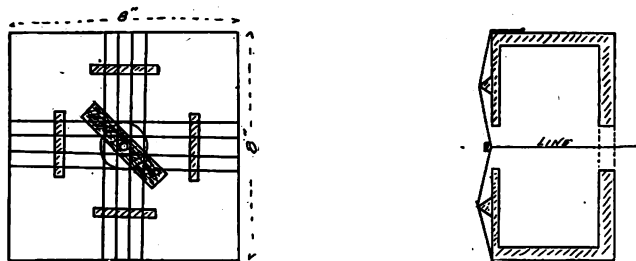


Fig 5. WOOD DIAPHRAGM

with a soft pine top, nearly half an inch in thickness in the middle and slightly less at the sides, and was overstrung with steel strings resting upon a bridge—or rather four bridges—placed upon the front. A pine stick, notched to fit the strings and hold them in place, passed over the center while connection to the wire was made at the center of this stick. The device talked fairly well at first and better as more experience in construction was gained, but the first box demonstrated that it was not likely to be a commercial success for it was anything but “fool proof”—a prime requisite in telephone apparatus—so that the scheme was soon abandoned.

Probably the most practical as well as sensitive telephone of the “acoustic” class ever put upon the market was the Shaver telephone—named from its inventor—which is shown in Fig. 6.

The box, about eight inches square, had a front of parchment about six inches in diameter. Extending over the parchment diaphragm, but with their ends fastened at the front of the box, were a series of wire loops extend-

ing about one and three-quarter inches over the diaphragm; these loops in turn were linked with other loops underneath the diaphragm which came in cone shape to a button near the bottom of the box. Thus we have a diaphragm all linked together so that the strain on every part is equally divided, while the elasticity of the parchment responds to every vibration of the wire.

The Shaver system, I believe, held the record for distance, one line being built about two miles in length, about as far as a strong-lunged man can “holler.” (Did you ever hear a West Virginia mountaineer call hogs?)

Almost any telephone of the acoustic class could be heard all over an ordinary room, but of course the shorter the line the louder they responded. It is also easier to recognize voices over these telephones than over any electric telephone I ever heard. Until the invention of the

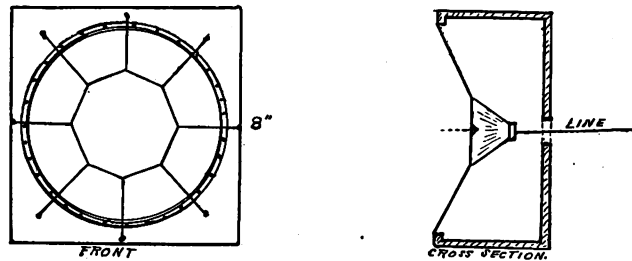


FIG 6. SHAVER TELEPHONE BOX.

electro-magnetic telephone, however, no practical attempts to improving it seem to have been made, but with the widespread installation of Bell telephones, interest in these devices was awakened owing largely to the fact that telephones of the electric kind could not be purchased and their rentals to private line patrons were enough to pay for the telephones every month. Under these circumstances acoustic telephones reached their highest development, and at one time in New York city there must have been at least 500 of these private lines installed by different concerns, while in Philadelphia they even built an acoustic exchange. The weakness of the system, however, lay, not in the instruments, which are much more perfect than their electric rivals, but in the lines, which will be described in the next chapter.

## Some Telephone Test Circuits

BY CHAS. H. COAR.

### CIRCUIT ARRANGEMENT.

The repairing or maintenance of the lines and apparatus in telephone systems involves considerable expense and in these days of central energy systems most lines are susceptible to many faults which in ordinary magneto exchange would not be noticeable. In central energy systems insulation becomes a factor which means much if good service is to be attained, principally because of the sensitiveness of the relays and signaling apparatus associated with the subscriber's lines and also because of the inductive effects to which most telephone lines are susceptible in the cities where extensive power systems are in vogue.

While in many instances certain faults produce certain results which are well known, it is desirable

to obtain as definite tests of the cause or location of the fault as is possible. The more accurate and the more readily these tests can be made means just so much aid in the consequent removal of the trouble. The circuits outlined below (Fig. 1) may be termed the test circuit proper, as it is by means of the different key manipulations that the apparatus is connected to the lines under test. This circuit is confined to the test desk proper.

The circuit shown in Fig. 2, may be called the “test trunk” as it is by means of this circuit that the lines are plugged up at the switchboard for the test set, the plug P, being located at the switchboard while the remaining apparatus is located at the test desk. The circuits shown in Fig 3, are termed the “Shoe Circuits” and are used when it is desired to make test from the

terminal rack, it then being possible to test towards the switchboard and also towards the subscriber's end. The keys involved in Fig. 1, are as follows:

A reversing key A, by means of which the tip and ring conductors can be reversed in their association with the remaining apparatus of this circuit.

A ringing key B, the power to which flows through a 1,000 ohm polarized ringer in order that by its ringing one may know that a circuit is provided.

A grounding key C, which is used in conjunction with the voltmeter during tests.

A voltmeter key D, by which the voltmeter apparatus is connected to the circuit.

A listening strip key K, which is used among other operations to connect the test talking set to the circuit.

A holding coil key, L, which is used to hold supervisory signals in a busy position during ordinary connections.

A battery key, M, which can be used to apply the exchange voltage to the test circuit. A telegraph relay arranged with a bell or sounder can be cut in series with the battery and this key, and thus can be used in locating intermittent trouble or in selecting cable conductors or as a rapid test for a clear line, etc.

A cut off relay key, N, with which the subscriber's cut off relay can be controlled.

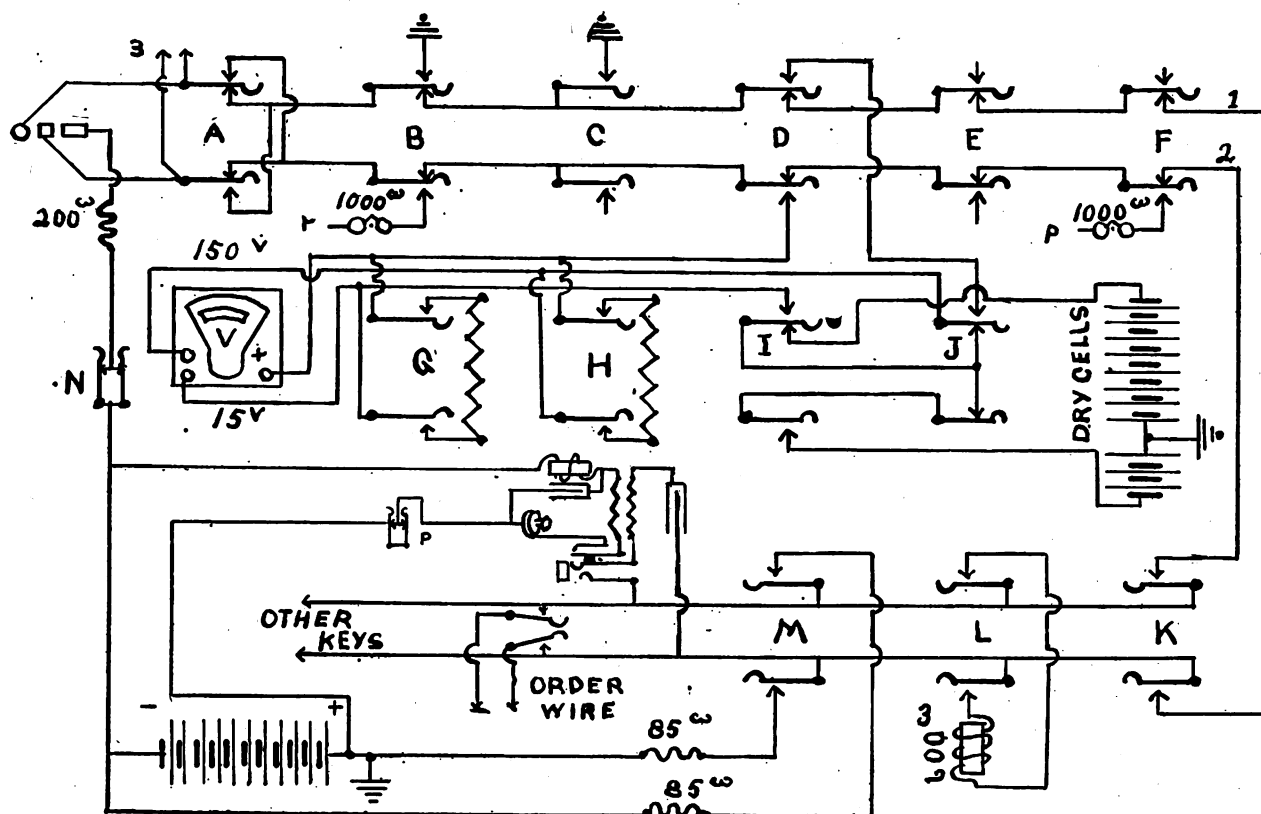


FIG 1.

A "Howler" key E, which has apparatus connected to it similar to that shown in fig. 5, the object of this being to attract the attention of subscribers, who have left their receivers off the hook, by causing the receiver to howl.

A continuous ringing key F, used when ringing current is desired for a length of time.

Two voltmeter shunt keys, G. and H., one shunt and key being arranged for each scale of the voltmeter. The voltmeter as shown is provided with a high and low scale arranged to operate with two batteries of dry cells suited to the voltage of the scale. The high scale in this instance has a resistance of 20,000 ohms and reads from 0 to 150 in volt divisions, while the low scale has a resistance of 2,000 ohms and reads from 0 to 15 volts in one-tenth volt divisions.

Two voltmeter battery keys, I and J, which are used to apply the different battery strengths to the respective coils during tests.

A transmitter key, P. which is used to open the transmitter circuit during times of disturbances from local noise or when it is desirable to listen on lines.

An order wire key over which the orders to the operator handling the test plug are given. Keys controlling other apparatus may be connected if it be desirable.

In the circuit shown in Fig. 2, it will be noticed that the test desk equipment is much the same as the ordinary switchboard equipment of each subscriber's line, consisting of a jack, a 30-ohm cut off relay, a sixty-ohm line relay and a 24-volt line signal lamp. In addition to this there is added a red line lamp arranged through a cut off button and tone test in such manner that it acts as a supervisory on the operator connections. In the circuit shown in Fig. 3, the J1 portion is used while tests are being made towards the switchboard from the terminal rack.

There is associated with this jack a cut off relay

arranged in conjunction with a condenser and 1000 ohm drop to be used in receiving calls. The J2 portion is used while tests are being made from the rack towards the subscriber's instrument. The equipment being identical with the subscriber's switchboard apparatus, will need no description. In the circuits shown in Fig. 4, the six numbered jacks are connected to a rack shoe which is used for toll line testing. The jacks have single contacts and are so arranged that it is possible to test towards the switchboard and to-

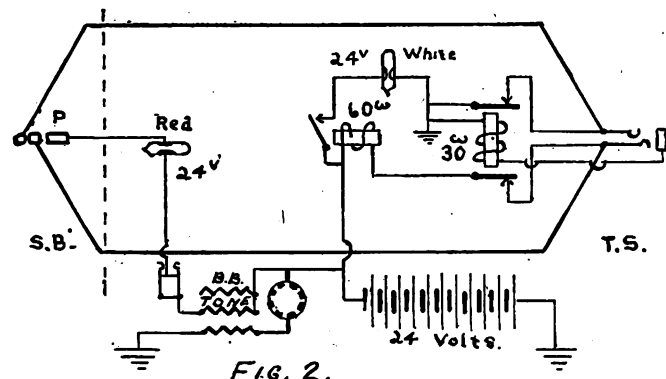


FIG. 2.

wards the line and also to bridge across the line. The remaining jacks are arranged in conjunction with the battery used with a Wheatstone Bridge, the arrangement as shown being such that different battery strengths are available. A ground jack and plug is also provided to be used while making Varley Loop or Murray tests. The keys shown in Fig. 4, are as follows:

1. A spare key.
2. A short circuit key which is used principally in locating inductive noises.
4. A hand generator key associated with a 1000 ohm bell in such manner that the bell may be bridged across the test plugs and calls received or transmitted in this position.
5. A cut off key by which this circuit is associated with the circuit shown in Fig. 1, at point 3.

Now assuming that a test is to be made the "tester" would order the operator to place the test trunk plug P. in the line he desired to test. This would cause

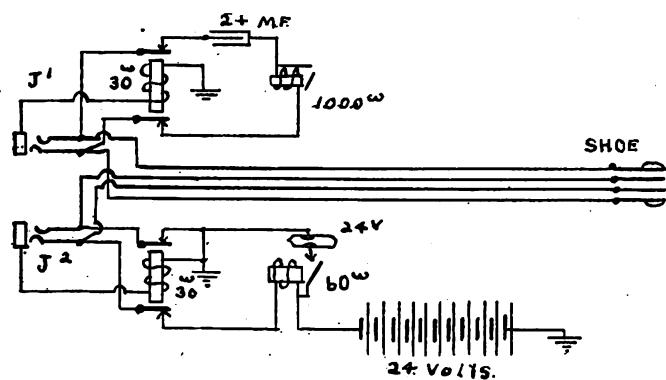


FIG. 3.

the red supervisory lamp to light, thus informing the "tester" that the operator had made the connection. A tone test is applied to the plugged up line to insure its freedom from any other connection during the time it is plugged up on the test trunk.

As the test desk end of the test trunk is provided with equipment indetical with the subscriber's switch-board apparatus, certain faults such as grounds, shorts, etc., would roughly inform the tester as to the nature of the trouble in case any existed. Presuming that the test trunk relay operated and caused the white line signal to glow, he would then put the test plug of Fig. 1 into the test trunk jack which operation would cut off the entire equipment from the tip and ring conductors.

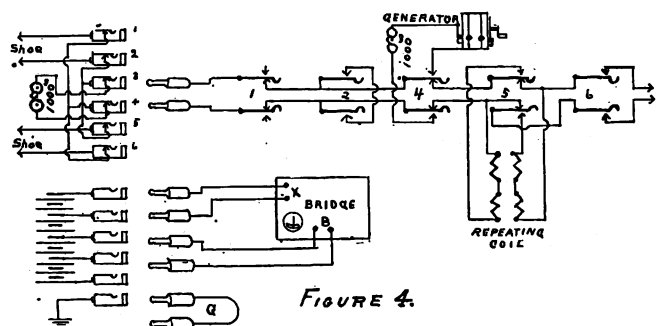
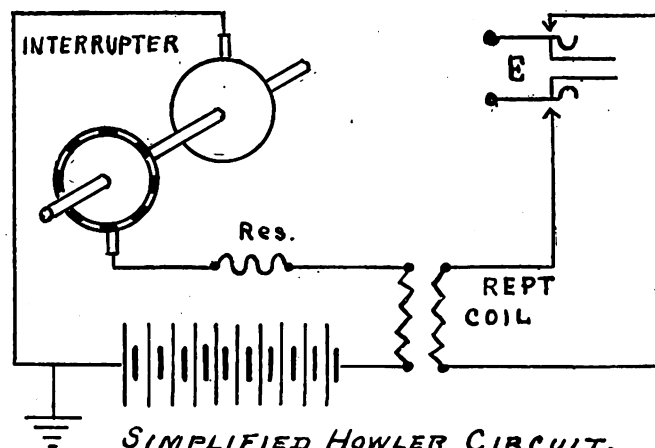


FIGURE 4

Then proceeding to test for a ground on the ring conductor, using the 150 volt scale, he would throw key D, which would place the voltmeter and battery in series with the ground at the battery and on the ring conductor, in case same is grounded, thus causing the deflection, which, if tabulated, means that a ground of so many ohms exists on the ring conductor. If no deflection is obtained, the reversing key A, is thrown in conjunction with key D, and this causes the tip conductor to be tested in a similar manner. To test for a short-circuit existing between the tip and ring conductors, the grounding key C, is thrown in conjunction with the voltmeter key D. The circuit is then formed from the ground at the positive pole of the test battery to the ground at the key C, thence out the tip conductor to the short circuit, back to the ring conductor to the positive side of the voltmeter and thence through the voltmeter and back to the negative pole of the test battery. The same tests may be made with the low scale by throwing in addition to the keys above mentioned the low scale key I. When it is desired to use a shunt in connection with the voltmeter, this can be



### SIMPLIFIED HOWLER CIRCUIT.

**FIG. 5.**

done by throwing key G, for the low scale shunt and key H for the high scale shunt. The shunts are very often necessary and will be taken up again when the methods of determining resistances by the voltmeter



are described. In case a line tests clear the "tester" rings out on it by pressing key B, and in case a circuit exists the bell connected to this key will ring. If the bell does not ring it signifies that no circuit is provided for the ringing current and an "open" may be looked for.

If, however, the circuit rings closed, the key N can be pressed, thus causing the test trunk relay apparatus to respond and light the line lamp as soon as the subscriber answers, when key N, is returned to normal and the key K, thrown which places the "tester's" telephone set in position for talking. Should it be desired to ring the subscriber's bell for any length of time such as is often necessary when an inspector is adjusting a bell, the key F, which is self-locking, is thrown, thus applying power to the line through a ringer, as shown. If battery current is needed out on the line, the same may be had by throwing key M.

The "tester" can get the answering operator of any line upon the test trunk by pressing the sleeve button shown in Fig. 2, which would allow the regular line relay apparatus to be operated by throwing the holding coil key L. In this manner the "tester" can try the line signals, etc. The key P, shown in Fig. 1, as explained, is used to open the "tester's" transmitter circuit in order that he may listen in on a line without being confused by local noises or side tones.

At times lines come in contact with other lines of the same or different system and it is very often desirable to read any current resulting from the cross. This may be accomplished by throwing keys D and J

in conjunction, which causes the 150 volts scale of the voltmeter to be placed in series with the tip and ring conductors. By using in conjunction with the above mentioned keys, the reversing key A, and the grounding key C, foreign current which is coming in over either the tip or ring conductors, may be read.

A "Howler" arrangement which is shown in a simplified circuit in Fig. 5, is a very useful appliance in all exchanges and should become a part of all test sets. By this it is often possible to save long, needless trips by the inspectors, as quite often receivers are left off the hooks or are partially held up by hooks, projections and otherwise, with the result that the line signal is permanent. By sending the "Howler" current over such circuits it causes the receivers to emit a strange weird howl, hence the name "Howler," which soon attracts the attention of any one in hearing with the result that the receiver is properly replaced. When it is desired to test a line from the terminal rack the "shoe circuits" shown in Fig. 3, are used; the key minupulations for the different test being the same as have already been described.

In using the test trunk circuit in conjunction with the "shoe circuit" many ingenious methods for locating certain kinds of trouble will manifest themselves to the "tester" after he has become familiar with the ordinary operations. In instances the circuits could be slightly altered or more apparatus or key combinations added which would make the set more adaptable to the needs of any particular exchange.

(To be continued.)

## Talks and Queries

### Readers, Please Note.

A large proportion of our readers send in queries without enclosing stamps, requesting that we answer by letter. We are glad to answer their inquiries so that they need not wait till the next issue for reply, but we must insist that postage stamps be enclosed otherwise the queries will remain unanswered. Several have asked questions that would require a volume to answer, and in these cases we will have to refer the writer to books relating to the subject. We are sure that our readers will not feel offended if we do not go into elaborate details when the information can be found in standard telephone literature, written better and more plainly that we can explain it.

### Lightning Protection.

Editor SOUND WAVES.—I would like to see the subject of lightning protection for rural lines (grounded system) discussed in the journal. I find so many that are afraid of lightning and would like to know what is considered the most advisable means of protection.

I have experienced some trouble in trying to arrange a switching apparatus so that a subscriber could use his 'phone to talk to two different party lines. I connected the lines, 'phone and extension bell as described in the enclosed diagram (Figure 1), and it mattered not which way the switch was thrown, I could hear and be heard on both lines at the same time. I tried connecting both to a gas line and also to separate ground rods, but with the same results both ways. I have used the same switch-

ing arrangement in other places with perfect satisfaction, and cannot understand why it should not work here.

If you consider these matters of sufficient importance I would be pleased to have you take them up in their turn.

X. Y.

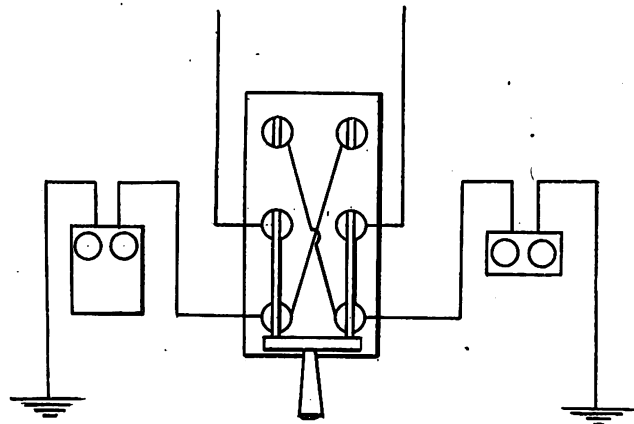


Fig. 1

The lightning seems to be the bane of the rural line, in fact, of almost any long line. It affects the rural subscriber more than the urban because there is usually more fireworks accompanying the storm on the rural lines. All manufacturers are now putting efficient arrestors on all their telephones, but they will not prevent the light-

(Continued on p. 25 following)

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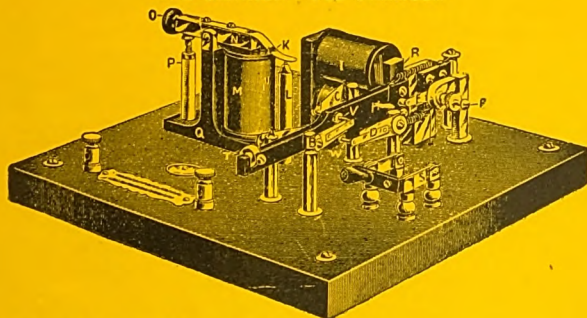
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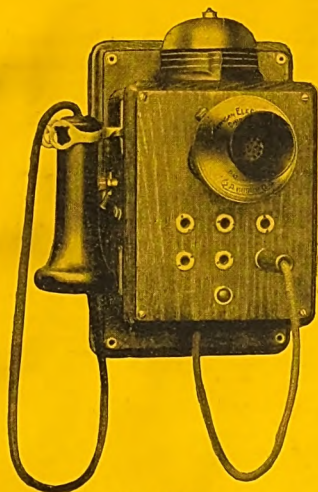
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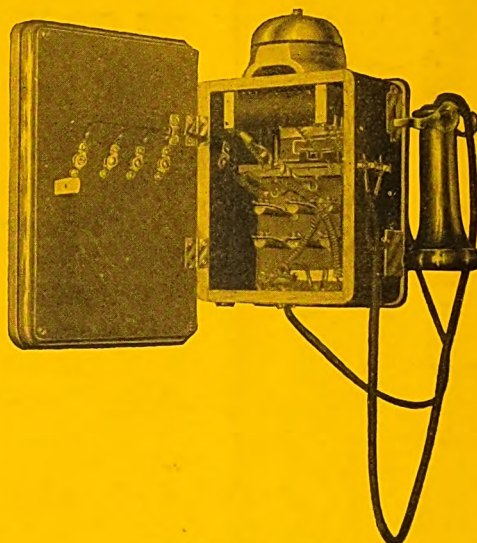


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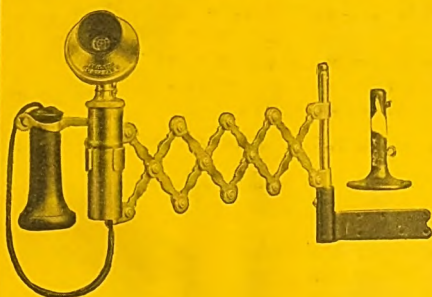
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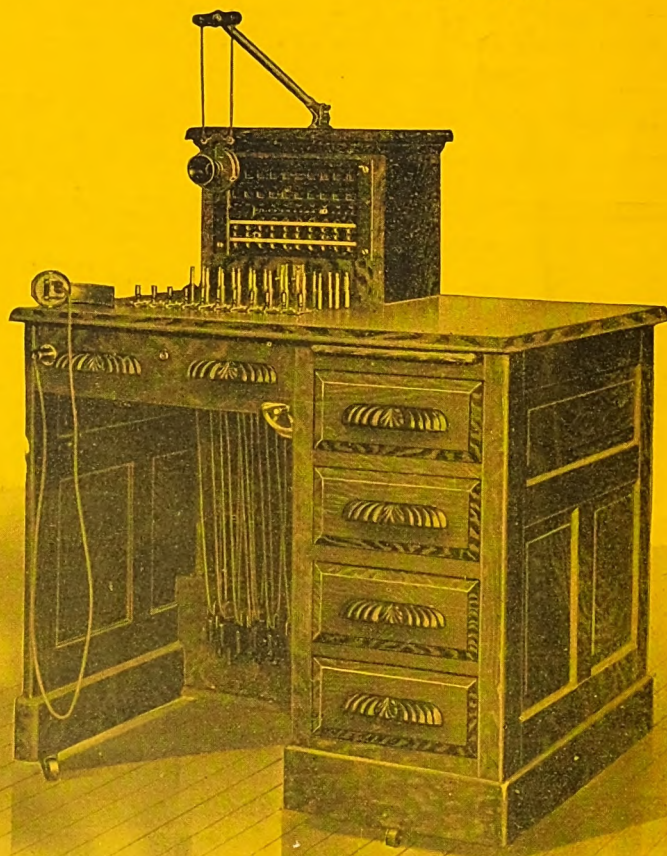
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VOL. XI.  
No. 4

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MARCH  
1906

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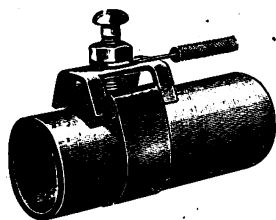
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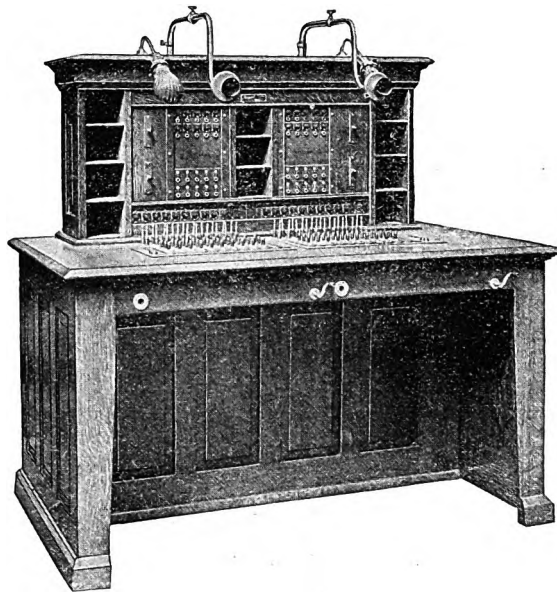




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# SOUND WAVES

A Monthly Magazine Devoted to the Interests of Independent Telephony

Vol. XI.

MARCH, 1906

No. 4

## SOUND WAVES

PUBLISHED MONTHLY AT LOGANSFORT, IND., U. S. A. PRICE FIFTY CENTS A YEAR

Entered as second-class matter July 14, 1903, at the Post Office at Logansport, Indiana, under Act of Congress of March 3, 1879.

The Thos. H. Wilson Co., Logansport, Indiana, Proprietors and Publishers

W. A. TAYLOR, Technical Editor. . . . . 1362 Monadnock Bldg., Chicago  
MERTON J. KEYS, Legal Editor. . . . . Box 1023, St. Louis, Mo.  
F. M. BAILEY, Manager. . . . . 1362 Monadnock Bldg., Chicago

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## EDITORIAL COMMENT

All communications to the editorial or advertising departments of this paper, answers to want advertisements, subscriptions, etc., should be sent to the Chicago office, addressed plainly to **SOUND WAVES**, 1362 Monadnock Bldg., Chicago, Ill. Subscribers and others will confer a favor and facilitate the work of this paper by complying with the above request. Technical and news contributions will receive prompt attention and are respectfully solicited.

## WEST WINS ELECTRIC LAURELS.

A few weeks ago ye olde town of New York, some day to be better known as the Atlantic shipping port for Chicago, got gay over a sudden and unexplainable feeling of up-to-dateness and tried to hold an electrical exposition. But the staid denizens of Knickerbockerville would none of it, and the show was a fluke. What cared they for volts, ohms and amperes? How could their sybaritic minds be roused long enough to think intelligently about such uninteresting implements of labor as motors and dynamos? What if wireless telegraph systems and the latest discoveries in the art of telephony, object lessons on the progress of the world, were open for inspection and investigation, should they attract the noble sons of the proud van Dutches further than to draw from their wallets the kopecks necessary to secure the service of these inventions?

And so it came to pass that when the New York show was over those who had put their money into the venture were much discomposed and declared it to be beyond comprehension that the citizens of Father Knickerbocker's town would tumultuously turn out to the races; ravenously devour the papers filled with yellow scandal; flock to the Court House to hear how Col. Mann had "touched" the best of them through Town Topics, and joyously welcome and entertain Sir Tommy This, Count That, Madame Rejane or Little Egypt, seeming to enjoy it all, while an appeal to their intelligence through the medium of an electrical exposition, representing all that is progressive in this important field, should fall still-born for want of patronage.

On the part of the promoters it was simply a case of reckoning without one's host. Senescent New York cares nothing for the things that interest and amuse virile modern Chicago. Some time ago a "newspaper fellow" from some town near New York (Boston perhaps) wrote a magazine story on his observation of the people of Chicago. To him they appeared restless, their movements nervous and excited, their faces hard and lacking in the nobility that characterizes the brow of the east. Let us admit the charge, but be it remembered that Chicago is young; growing, puzzling the world with marvelous industrial audacity and great business projects. Its nervous, forceful population, alert, active, curious, anxious to do and willing to dare, eagerly examines every foot

mark on the path of progress and rushes on in pursuit of those that point to successful achievement. The ancient gentility of New York, on the other hand, is busy with other things. Its members prefer to be arbiters of fashion, exponents of ease. "And so from day to day they ripe and ripe. And so from day to day they rot and rot; and thereby hangs a tale."

Now the tale briefly told is this. Chicago has just held her electrical exposition. In the vast Coliseum were gathered together the latest inventions and discoveries in the field of electricity. The displays consisted of live, working exhibits. When the doors were thrown open and the wheels set in motion, President Roosevelt aerographed a message of good wishes, and for fourteen days the great building overflowed with the tide of Chicagoans and visitors from the adjacent west. The result of it all was that the show was a success from the standpoints of intelligent, studious investigation, representative attendance and financial gain.

And yet, dear old Broadway will be reclaimed. We are from time to time sending east some good leaven from the West. Some of these days, no doubt, they may be able to conduct a successful electrical show and attract intelligent patronage. By that time, we out in the west, will perhaps have perfected the electrically propelled airship, and with pockets full of "simoleons," we can cruise over to take part in the rejuvenation of effete New York.

### SUPPING WITH THE DEVIL.

We regret to note a tendency on the part of one of our esteemed contemporaries to further Bell interests by countenancing in its columns an attack on Independent interests as represented by the municipal plants of Great Britain. In the January issue of *SOUND WAVES* we called attention to this mistake; there is no excuse for our contemporary in pursuing this course. The nature of the article by Herbert Laws Webb in its January issue shows a desire to "knock" the British Independents, for what good reason we cannot fathom. Its February issue contains an editorial in reply to a criticism from a correspondent attempting to explain its attitude with the time-worn excuse that it stands for Truth, no matter whose head is hit.

Our contemporary is supposedly an Independent journal. It has passed the speculative stage, supposedly. It is no longer a neophyte. If it does not know the truth now, after some years of advocacy of Independent telephony, it is not likely to learn from Mr. Webb or any other imported Bell advocate.

From no less than three sources, each able and conscientious, we have received criticisms of our contemporary's attitude. We are loath to believe, as one of our correspondents hints, that our contemporary is intentionally furthering Bell interests. We hope it is not trying to "carry water on both shoulders." We cannot understand why, with such ample opportunities to secure an impartial review of the British telephone situation, our contemporary should have lent its columns to a prejudiced observer. By so doing it has incurred just criticism, and laid itself wide open to the serious charge of being a "Bell" advocate. It must remember that those who consort with Bell men incur the suspicion of Bell contamination. "He who sups with the devil must use a long spoon."

In its explanatory editorial of February last, our contemporary says:

"In fact, it would seem that a proper understanding of the municipal ownership question as applied to telephony, is more likely to benefit the Independents than the Bell, since in this country it is believed that Independent companies are more liable to fall into the municipal ownership pitfall (if it be a pitfall) than are any of the Bell companies."

Surely. We want a "proper" understanding of all things. But if, by a proper understanding is meant such a one as we get from Mr. Webb's one-sided attack, we don't want it. It appears to some critics that Mr. Webb has run amuck. He is, or was, in the employ of the British Bell company, and came to this country to testify before the Canadian Parliamentary Committee for the investigation of telephones. His testimony before the committee did not bring such confusion to the ranks of the municipalists as the Bell doubtless hoped it would. Mr. Webb fell down there, because he could not show that the British Bell gave much, if any, better service than its Independent compatriots.

One of those who has criticised our contemporary is Mr. C. O. Harris, superintendent of exchanges, Utah Independent Telephone Company. His letter is vigorous. To it our contemporary has endeavored to reply in the editorial referred to. Mr. Harris says in substance:

That he commends the stand taken by *SOUND WAVES* in its January editorial, "Attacking Municipal Telephony in Great Britain Furthers Bell Interests." The action of our contemporary in lending its pages to Bell advocates excites his disgust and wrath. Mr. Harris says: "It is enough that the Independent interests have to read articles of the same tenor sown broadcast throughout the country in the daily press, without having to see the publications supported by themselves injuring their interests."

"The municipal telephone interests everywhere are the direct competitors of the Bell. Any cause that has for its object the overthrowing of that vicious monopoly is worthy the support and encouragement of every Independent telephone man. All telephone interests not Bell are Independent, irrespective of the locality or who is operating the plants."

Our contemporary's editorial reply to this will not hold water. They seek to have us infer that their attack on municipal telephony is for the sake of warning the country against the pitfalls of municipal ownership, and that they are "agin" something that may overthrow both Independent and Bell interests, while in the next breath they disclaim responsibility for Mr. Webb's article, thus accomplishing a straddle of the issue. We don't know which leg they will elect to stand on finally. If municipal telephony is coming, however, even the mighty blasts from our contemporary's horn won't stop it. We don't advocate it; but there is something worse—Bell monopoly. If the one is purgatory, the other would be hell. With municipalism in the saddle there would still be extension and progress. Independent manufacturers would still find a market for their goods and able engineers would still be in demand.

Mr. Harris continues:

"Ever since the Bell Telephone Company set its foot upon European shores it has attempted the same high-handed and cut-throat methods that it practices and attempts even now to practice in this country where competition has been shut out."

"In the early 80's it made its appearance like some dreadful plague, and its slimy trail can be seen to this day. England, Holland, Belgium, France, Germany,

Switzerland, Italy, Spain, Greece, Sweden, Norway, Denmark, Russia—in fact, nearly every country in Europe was an unwelcome host. As its history was in America, so was it in Europe. Some countries acted promptly and effectively and took such steps as would render void the attempts made to create a monopoly. In some instances patents were refused; in others, concessions were not granted; in others, municipalities embarked in the business with greater or less success.

"Ever since that time the Bell interests have fought both by fair and foul—generally foul—methods to break-down competition. It is trying to make a stand in Great Britain and endeavoring so to hoodwink the Independent telephone men of this country that, without asking their assistance, to get them to help make stronger their untenable position.

"Are we to submit to this? Not if we can help it. It is the duty of every Independent telephone man who loves the cause and its workers to help and encourage our Scotch friends. Write them. Sit down and dictate them a personal letter. Give them the benefit of your advice, your brotherly assistance and cooperation. The Scotch are a sturdy race and fighters. Show them the righteousness of the cause and they will drive such usurpers from their shores, as they have done in the centuries before. The Independent telephone men in this country glory in the fact that we all help each other when it comes to fighting the common enemy, the Bell Company. Is it any less our duty because the wide Atlantic separates us?"

But to return to Mr. Webb and his article: We can hardly suppose that our contemporary is in ignorance of the antecedents of Mr. Webb, but in order that Independent telephone men may estimate the literary efforts of that gentleman at their true value, and judge as to the sincerity of his motives in contributing to Independent telephone journals, we take this opportunity to throw some light on the subject.

Until about three years ago Mr. Webb was assistant general manager of the New York Telephone Company, when he migrated to London, England, where he set up ostensibly as a consulting engineer. So far as we have learned, however, the only telephone work in which he has figured in Great Britain has been in the capacity of an expert witness for the National Telephone Company at local government board inquiries, with the object of preventing the granting of borrowing powers to municipalities desiring to compete with the monopoly. Although posing as an independent witness at these inquiries, he has been compelled under cross-examination to admit that he is a paid official of the National Telephone Company; and in not a single instance has he been successful in preventing the municipalities from obtaining the powers asked for.

To come a little nearer home, let us again remind our readers that the Canadian government recently held an inquiry into the telephone situation in the Dominion, with a view to securing relief from the evils of the Bell monopoly in that country.

There are already a number of successful municipal systems in Canada. These systems were equipped with the most modern plants purchased from United States Independent telephone manufacturers, and the service has been so far ahead of anything hitherto supplied by the Bell that, combined with the low rates, the result has been hopelessly to cripple the monopoly in these towns. This success has led other municipalities to do some hard thinking, and there is a general feeling today in Canada

that the government should either own the long distance lines and that municipalities should either own the local systems outright, or encourage the establishment of local companies.

In order to avert the danger thus threatened to the Bell Telephone Company of Canada and its largest shareholder, the American Telephone and Telegraph Company, Mr. Webb was brought over from England (of course, as an absolutely unbiased and independent witness) to convince the Canadian Telephone Committee of the horrible things which would happen if this government long distance line and municipal telephone idea was not strangled at the outset. Further than this, the committee was warned against the awful waste of money resulting from telephone competition and the relatively insignificant benefit to telephone users. Among other things, the committee was informed that, "Government ownership in Europe is a blight on the whole telephone business," yet, strange to say, a few weeks later Mr. Webb was found in the committee room of the British House of Commons supporting to the utmost of his ability the policy afterward adopted by the government, ratifying the agreement for purchasing the business of the National Telephone Company. In other words, the testimony of Mr. Webb at Ottawa was diametrically opposed to his actions in London a few weeks later.

The visit of Mr. Webb to Canada was not so successful from a Bell standpoint as might have been desired, for he was unable to convince the chairman of the committee that because certain British municipalities might have made mistakes in the past, it therefore followed that Canadian municipalities were incapable of doing any better. It would now appear that Mr. Webb is using our contemporary to discourage telephone competition by municipalities in Canada, for there is not the slightest reason to suppose that an article of this kind can have any bearing on telephony in the United States.

We do not propose, as we have said before, to discuss the relative merits of telephone equipment and practice in Europe and the United States, for no possible good would result therefrom. It might be a matter of general interest, but only as such can we take it up. We know, however, that if it suited Mr. Webb's purpose, he could quite as consistently ridicule the class of equipment in Stockholm, Sweden, or Berlin, Germany.

Granting, however, that the plants referred to by Mr. Webb are such monstrosities of telephone engineering, we would ask what object a professedly Independent telephone journal can have in wasting valuable pages in the reproduction of such curiosities, when there are thousands of readers needing to be informed of modern methods and hundreds of Independent telephone men willing to furnish material wherewith to educate and enlighten their less informed brethren?

If the motive of such articles is successful, the Bell monopoly in Canada will be perpetuated and the Independent manufacturers in the United States will lose business, which promises to increase materially in the near future.

One of our contemporaries a few months ago, referring to Mr. Webb's visit to Ottawa, alluded to that gentleman as "doing the Devil's work in Canada." We would go a step further and again remind our contemporary that "he who sups with the Devil must use a long spoon" if he desires wholly to escape the results of such companionship.



# Kansas Independents Meet

The annual convention of the Kansas Independent Telephone Association was held in Wichita Monday and Tuesday, Jan. 22 and 23. The meeting was largely attended, the secretary of the association stating that between 150 and 200 members were present.

The greatest work accomplished by the association was the adoption of a new constitution and by-laws which enable the local exchanges to form a closer organization in their respective communities, thus giving the state association a better organization.

Little business was transacted at the session held on Monday, other than the appointment of a few preliminary committees. The address of the president, A. A. Godard, of Topeka, was heard. It met with a great deal of favorable comment. The address of W. P. Hemphill of Topeka on the subject of telephone revenue was one of the best that was made before the convention and is given elsewhere in this issue.

A smoker was tendered the visiting telephone men by the local promoters at the Carey Hotel Monday night. The smoker was well attended, fully 200 men being present. F. M. Pearl of Hiawatha acted as toastmaster.

Everything moved along serenely at the second day's session until the question of continuing the membership in the National Interstate association was brought up by Secretary Pearl. Robert Burns, of Hutchinson, was opposed to the proposition and made a motion putting the matter in the hands of the executive committee with power to act. A substitute was offered by Mr. Petts, of Atchison, instructing the executive committee to make an assessment to pay the dues. Vice-president Gary, of the National association, who was present, explained the work of the national organization and said that he thought that all the opposition originated with the Kellogg Switchboard and Supply Company.

This remark brought Mr. Burns to his feet. He said that it was an insinuation against him, as he was a user of the Kellogg apparatus and he wanted it understood that he was not influenced by the Kellogg people at all but was opposed to the movement because he could not see any benefit to be derived from it.

When the vote was finally taken on the substitute it was carried by a large majority.

Mr. Pearl then made a motion to the effect that the convention was in favor of remaining in the National Interstate association. This was also carried.

## PROF. KELSEY SPEAKS.

J. C. Kelsey, consulting engineer from Chicago, and who is well known to our readers through his writings, addressed the convention on the subject of the Sublicense Question. He said in part:

"We have all heard of the reader story of the spider who invited the fly into her pretty parlor. This sublicense game always reminds me of it. The man who signs a sublicense contract soon sees what is in the parlor.

"The sublicense game is designed for the protection of the Bell Company and the utter destruction of the Independent interests.

"The first idea was that the Independent agitation would soon die down and it would be useless to spend money in an enterprise that the people would soon tire of. Therefore they would get all the long distance business as long as the new enterprise lasted.

"The second idea was that in getting a company tied to them solely, they would retard the growth of others, and the main idea was that the Bell company could not afford to compete.

"We all know that the telephone agitation is of a permanent character. It is a profitable business. It has exceeded the expectations of every one. Its future is so great that prediction seems absurd.

"You must get out of the idea that the Bell Company has money to throw away. They are begging and borrowing money all over our country and Europe. They are up against it harder than any of you. If they threaten you, call their turn. They are bluffing and the game will soon reveal it.

"You must not overestimate the long distance privileges. What do Wichita Independent patrons care for long distance service with the east. How many more telephones would the company have if the Wichita people could call New York? Not one.

"It is a local enterprise. If you have your city, you have gained 90 per cent. If you can call your county towns you have gained nine per cent more. The benefit you can get from a sublicense contract is limited to one per cent. Stick to your 99 per cent and don't risk the whole property for a doubtful one per cent.

"My explanation of the theory of the sublicense contract is this 'It is heads the Bell wins, tails you lose.'"

The committee on revision of constitution and by-laws which was appointed at the first session, consisting of W. H. Nelson, of Smith Center; J. E. Byers, of Ottawa; J. C. O. Morse, of Wichita; and W. P. Hemphill of Topeka, reported at the morning session. The new by-laws, as adopted, were drawn with a view of forming a more perfect organization between the small local exchanges. The State is divided, under the new by-laws, into six districts, each in charge of a vice-president.

The following officers were elected for the ensuing year: William Nelson, Smith Center, president; F. M. Pearl, Hiawatha, secretary. District vice-presidents were elected as follows: First district, C. E. Betts, Atchison; second district, W. Miller, Olathe; third district, A. E. Herzberg, Independence; fourth district, Charles Henderson, Alma; fifth district, John Doyle; sixth district, C. C. Vandeventer, Kingman. H. D. McVey of Wichita was elected a member of the advisory board for the National association.

The president was authorized to appoint delegates to the National convention to be held in St. Louis in June as soon as the representation allowed Kansas in the National convention was ascertained.

The selection of the meeting place of the next annual convention was left in the hands of the executive committee.

William Nelson, the newly elected president, appointed the following executive committee: J. E. Byers,

Ottawa; A. P. Rogers, Beloit; Harry Camman, Winfield; R. M. Emery, Seneca; and C. S. Brown, Abilene.

Among the representatives of the different companies from the various parts of the state who were present at the meeting are: W. G. Miller, Citizens' Telephone Company, Atlanta, Kan.; F. W. Mackey, Columbian Electrical Company, St. Joseph, Mo.; Homer Caldwell, United Electrical Co., Wichita, Kan.; A. B. Clark, Herrington Telephone Co., Herrington, Kans.; J. W. Smith and F. S. Flint, Minneapolis Telephone Exchange, Minneapolis, Kan.; R. M. Emery, Seneca Telephone Company, Seneca, Kan.; C. C. Raymond, Lindsborg Telephone Co., Lindsborg, Kan.; R. H. Shore, Winchester Telephone and Electric Company; T. H. Youmans, Osawatomie Telephone Co., Osawatomie, Kan.; S. H. Williams, Southwestern Telephone Company, Mead, Kan.; Frank Lanley, Stafford Telephone Co., Stafford, Kan.; E. B. Kellan, Chase County Telephone Company, Cottonwood Falls, Kan.; R. C. Hall, Ellis Telephone Company, Ellis, Kan.; J. A. Zimmerman, Valley Falls Telephone Co., Valley Falls, Kan.; J. C. Kelsey, Kellogg Switchboard

and Supply Company, Chicago; J. C. Valentine, Northern Kansas Telephone Company, Effingham, Kan.; J. T. Elder, Home Telephone and Electric Company, Cunningham, Kan.; C. E. Betts, Atchison, Kan.; C. C. Vandeventer, Kingman Independent Telephone Company, Kingman, Kan.; F. M. Pearl, A. J. Stevens and Felix O'Neel, North East Kansas Telephone Co., Hiawatha, Kan.; G. S. Sifferd, Stromberg-Carlson Telephone Manufacturing Co., Ottawa, Kan.; W. P. Hemphill, Independent Telephone Company, Topeka, Kan.; W. R. Pettijohn, Hoyt Telephone Company, Hoyt, Kan.; George W. Watson, Kingsley Telephone Co., Kingsley, Kan.; W. W. Dilworth, Solomon Valley Telephone Co., Beloit, Kan.; W. H. Wilson, Exchange Telephone Company, Smith Center, Kan.; D. D. Brunwell and J. N. Dayle, Belleville Independent Telephone, Belleville, Kan.; C. A. Starr and B. F. Bess, Pratt, Kan.; C. B. Anderson, Waubausee Telephone Co., Alma, Kan.; C. H. Cornwall, R. M. Cornwall and G. Z. Taylor, Mount Hope Telephone Co.; Mount Hope, Kan.; F. A. Gresham, Home Telephone Company, Bucklin, Kan.; C. J. Rich, Havalan Telephone Company, Havalan, Kan.

## Nebraska Independents Meet

### WHAT THE CONVENTION DID.

Passed resolutions favoring united action to support wholesale interests in only those cities favorable to Independent telephone interests.

Provided for arbitration board and traveling secretary.

Provided for districting state into five districts to handle local matters.

Raised ample funds for association expenses for 1906.

Provided for early issue of a state directory of 35,000 Independent telephones.

Endorsed work of former legislative committee, which was reappointed.

Affiliated with the National Interstate Telephone Association representing 14 states and 2 million telephones.

The annual convention of the Nebraska Independent Telephone Association was held in Lincoln, Jan. 23 and 24, and was the most important gathering of telephone men held in this part of the country. Representatives from a number of adjoining states were present, and much important business, as summarized above, was handled by the convention. A hundred and fifty companies had delegates present, and a number of manufacturers were represented by salesmen and by exhibits, which formed a valuable part of the convention's attractions. The association is making most satisfactory progress, the secretary's report showing a growth during the year that is remarkable. Steps were taken to carry on the good work of the former legislative committee, consisting of Frank H. Woods, Judge Allen W. Field, and Col. C. J. Bills, which only failed of securing an independent telephone measure in the last legislature by one vote. The convention was attended by T. H. Gary of Macon, Mo., vice president of the National Interstate Telephone Association. The executive committee was authorized to divide the state into five or more districts, such districts to

handle in their local meetings all matters of purely local interest, including arrangement of toll service, division of territory, etc. The executive committee was constituted an arbitration board to settle disputes where necessary. The appointment of a traveling secretary will insure a more rapid extension of membership in the association, which while it has grown rapidly and includes all the principal companies of the state, yet can do much better service by taking in as many as possible of the other independent companies. The assessment levied for supplying funds to meet the aggressive campaign during the coming year was passed unanimously, and indicates the good financial condition of the members as well as their appreciation of the importance of the association's growth to them. The provisions for making a state directory, containing the names of 35,000 people now accessible by toll-lines, will mean that where now thousands of people can be reached only by messenger, under the new dispensation they can be reached directly at their homes or business houses.

The Fremont Commercial club sent in an invitation to hold the next convention in that city. The convention closed with a successful banquet. The following officers were elected for the coming year; Frank H. Woods, Lincoln, president; W. Clapp, Kearney, vice-president; R. E. Mattison, Lincoln, secretary and treasurer. In addition to the above, W. E. Bell, of York, Thos. Parmalee, of Plattsmouth, and G. J. Garlow, of Columbus, constitute the board of directors. Delegates to the National Association: F. H. Woods, Lincoln; W. E. Bell, York; T. H. Pollock, Plattsmouth; alternates, R. E. Mattison, Lincoln; W. J. Stadelman, Kearney; I. D. Clark, Papi-lion.

At the annual meeting of the Telephone Traffic Association, which handles the clearings for toll business, the following officers were elected: T. H. Pollock, Plattsmouth, president; W. E. Bell, York, vice-president; R.

E. Mattison, Lincoln, secretary; F. H. Woods, Lincoln, treasurer.

#### SECRETARY'S REPORT.

Following is the report of G. T. Everett of Columbus, who was secretary of the association up to November 14. He resigned and the office has been conducted since by R. E. Mattison, of Lincoln, as acting secretary. Mr. Everett's report says:

The past year on the whole should be satisfactory to the independent interests in the state of Nebraska. A great amount of building has been accomplished, both toll line and exchange work. In exchange work, notable examples are Hastings and Holdrege, now in operation, and Tecumseh, now building. Several hundred miles of copper toll line have been completed which have extended and improved the toll line service to a marked degree.

Our most serious trouble has been the desertion of some of the smaller companies to the enemy. The opposition has been very active along this line and it is safe to say that practically every independent company in the state has been approached either directly or indirectly with a proposition to make toll line connections with the opposition. We are glad to report that, with the exception of

November 14, is given below. This report gives the first accurate figures on the telephone business of the state. These figures are not estimates, but are a compilation of individual reports secured by the secretary from letters sent to each locality. The report states that a million dollars has gone into telephone plants in the past year. The growth of toll lines is most encouraging, and the constant efforts of the state association to secure standard toll line connections and uniformly good service will have an increasingly powerful effect to popularize the Independent telephone movement.

Following is the acting secretary's report:

#### Nebraska Independent Telephone Association:

Gentlemen—The acting secretary begs leave to submit the following:

Statistical reports have been received from fifty companies operating in the South Platte territory, all enjoying an independent toll line business except four companies. The report summed up shows the following figures:

Independent telephones operated .....	36,028
Switchboards operated.....	138
Toll stations operated.....	166



NEBRASKA CONVENTION GROUP

not more than three, none of the companies of any importance have deserted, and one of these was completely isolated from the other independent companies of the state. A number of smaller companies, however, have gone over, and your secretary would earnestly recommend that the association keep a man in the field, or at least make arrangements to have first call upon some competent man's time, who will go out in the field and meet the Bell agents and endeavor to keep the weak companies in line. Experience has shown that in a large majority of cases we can win out if we make a fight.

A notable accession to independent ranks this year is David City which for five years has been a Bell licensee. I am sure, with proper attention, other licensees would come to our ranks.

#### THE YEAR'S STATISTICS.

The report of R. E. Mattison, acting secretary since

Miles toll line.....	3,148
Money invested.....	\$3,118,400
Number of stockholders .....	3,640
Number of Bell telephones operated in same territory.....	11,902

These figures do not represent in any way the total number of telephones operated throughout the state, these being practically the number of telephones connected with one another by toll lines. One year ago today there were no independent telephones in Nebraska that could talk with more than 5,000 other independent telephones. Today any one of the 35,000 telephones can talk with any of the others of the group, all having been connected during the past year.

Sixty-two new companies have been incorporated in this state during the past year, which, together with extensive improvements to other plants, represent an expenditure of at least \$1,000,000. Conditions in Nebraska are far better today than they have been at any previous time. The

territory is being developed faster and is being equipped with better apparatus than has been used heretofore. The territory already developed by toll lines shows three independent telephones to one of the opposition and as additional territory develops the percentage will not decrease.

#### GOOD RESOLUTIONS.

The unity of feeling that marked the whole convention was shown most markedly in the passage of the resolutions, on every one of which the vote was unanimous. Following is the text of the resolutions:

Whereas, Disputes and differences between independent companies in this state are constantly arising, and for want of proper conception of the rights of each and a willingness to make equitable concessions, ill feeling and unwise actions often result to the detriment of the independent cause; and

Whereas, Many of the smaller companies for lack of business management, funds to operate and encouragement and advice, fall into the hands of the Nebraska company; and

Whereas, There are a great many companies operating independent lines who are not members of this association, and who, by reason thereof, are amenable to no rules but arbitrary ones established by themselves; and

Whereas, It is to the best interests of each company and of the whole to be united for the common good of all; and

Whereas, Many of the smaller, as well as some of the larger, companies, and especially those just beginning, use poor judgment in the choice of material or in the manner of construction, or both; and

Whereas, All these things are a detriment to the success of the independent telephone business; and

Whereas, It is to the interest of all the stockholders and subscribers to raise the standard of construction, material management and services, and to have a general and uniform understanding of the business and to maintain a friendly feeling among all; to have disputes settled out of court and to the interests of the parties concerned, and to lend aid in organizing new companies and to hold all that are organized and to raise the independent system to the highest standard; now, therefore, be it.

Resolved, That the executive committee of this association be, and hereby is, empowered to employ some suitable and practical man well versed in the business, whose duty it shall be to carefully look after the matters and things herein referred to, and to all matters relating to the telephone business which will promote its good, and to carefully inspect their systems, note their defects and advantages, use all honorable means to induce every plant to become a member of this association; to encourage the building of good, metallic systems and to discourage everything that cheapens or produces poor service; to make written statements of all disputes between companies and keep a record of condition of plants visited and of everything which, in his judgment, needs correction or adjustment of that may be required of him by said committee, whose duty it shall be to consider and pass upon, and in the judgment of a majority of said committee, equitable adjust all matters submitted to it, and should said committee be called upon to arbitrate a matter, each disputant must bear one-half the actual expense, unless otherwise agreed in writing.

That for the purpose of making this resolution effective and practical a fund shall be created to pay the expenses incurred by reason of this resolution, and other current expenses of the association. It is hereby provided, that each company belonging to the association shall pay 10 cents on each phone in use and on the number of circuit miles of toll line operated by it; that is, each company shall pay 10 cents per unit.

Said executive committee shall meet at such time or times as may be necessary to adjust matters submitted to it and that each member thereof be paid necessary expenses incurred while so engaged.

It is further provided that the state association hereby appropriate the sum of \$3,000.00 to be used for the purpose of carrying out the intention of this resolution. Respectfully submitted.

Resolved, That inasmuch as the numerous independent telephone companies in Nebraska are built by local capital

furnished by merchants, professional men, bankers, stockmen and farmers, consisting of over 5,000 stockholders who have invested their money in the telephone business for the purpose of getting cheaper and better service and as an investment, and inasmuch as it is now possible to reach over independent toll lines nearly every city in the state, and many wholesale centers in cities having independent telephone systems, therefore, be it,

Resolved, That all independent companies, through their numerous stockholders and friends, use all honorable means to induce the merchants in the different cities and towns to patronize wholesale houses located in cities having independent telephone systems.

#### Convention Notes

The Monarch Mfg. Co.'s exhibit was in charge of A. J. Carter, of Sioux City, Ia. The Western Tel. Mfg. Co. was represented by O. A. Strauss of Chicago. Frank B. Cook had two representatives, F. A. Rader, and P. M. Chamberlain. The Western Elect. Co. of Omaha, was represented by their Mr. O'Connell, generally suspected of being an Irishman. G. A. Briggs, president of the Chicago Tel. Supply Co., was present and assisted their Mr. G. W. Brown in showing Chicago goods. Mr. Briggs also responded ably to the toast "Twenty-five Years Hence," at the banquet at the close of the convention. The Baird Mfg. Co. was represented by J. W. Harris, of Lincoln. Some one suggested that "Baird Knockout" was a more appropriate name and this appellation stuck through the convention. Mr. Harris had several phones wired up so as to demonstrate the working of the system to a better advantage and several who saw them in operation said they knocked out the "listeners in" all right. The Vought-Berger Co.'s exhibit was in charge of R. C. Fields, of Lincoln. A number of cards bearing appropriate advertising and suggesting that you "ask Fields" were tacked up in conspicuous places about the hotel; Someone got busy with a lead pencil on one which read, "Without a Peer, ask Fields," and the way that sign read after the operation was, "Without a BEER, ask Fields." The Eureka Elect. Co.'s exhibit attracted considerable attention, being practically a telephone exchange in operation. Their four-party selective system was favorably commented upon by many of the visitors. The exhibit was in charge of E. L. Larabee, of Beatrice, Neb., western representative, assisted by V. H. Messenger, treasurer of the Eureka Co., and G. O. Sutton. The Illinois Elect. Co. was represented by their Mr. McIntyre, also Irish. The Electric Appliance Co. was represented by E. V. Brown. The Columbian Elect. Co. of St. Joe, Mo., by Mr. Strong, and the Nebraska Elect. Co., of Omaha, by A. G. Munro. We came near forgetting the Kellogg Co., represented by Mr. Pope. Several of the Independent operators resented the presence of the Kellogg exhibit at the convention and one of the delegates although he did not mention the name of the Kellogg company, made a few remarks at the first day's session which everybody understood to mean that corporation. We are unable to give the words verbatim, but this is the substance of his remarks: "It seems to me that we should be able to hold an Independent telephone convention without the presence of Bell representatives or Bell sympathizers. While we cannot prevent people who affiliate with the Bell companies and the like from stopping here at the Lindell (the hotel at which the convention was held), we can at least refrain from introducing our friends to them and we need not visit their rooms. We can thus show them plainly that their presence is not appreciated by this convention."





# Electrical Show a Success

To possess an adequate idea of the Electrical Exposition, the first of the kind ever held in Chicago, one must have attended it in person. Judging by experiences in other cities, it was quite freely predicted that the show would be a "frost," but such was by no means the case. The variety and extent of the exhibits, the popular interest which attaches to things electrical, and the spectacular as well as the practically useful features presented, all combined to merit the remarkably high record of attendance achieved during the two weeks the show was in progress.

While the telephone and its accessories, technically considered, do not catch the eye of the non-technical public, yet those who attended the show manifested no little interest in the telephone exhibits and doubtless carried away with them a good many new and interesting ideas with regard to telephones—ideas which sometime may bear fruition in the increased attention and support given the telephone business by the investing public. In this way only can the public help the telephone. But to the telephone man, and especially to the engineer, the exhibits presented could hardly fail to be of surpassing interest. The largest Independent telephone manufacturers in the country vied with one another to present what would at once catch the popular eye and at the same time interest telephone engineers and managers. The latest and best ideas in new apparatus were shown and freely examined and explained to all those manifesting an interest.

There was much of value to the man devoted to the general subject of electricity; indeed, electrical devices of all kinds were shown and electrical stunts given ample demonstration. We can afford to pass over the general features somewhat briefly and devote the most of the allotted space to a description of things telephonic.

The Exposition Company showed its enterprise in many ways, among which not the least attractive feature was the series of free lectures given in the annex hall by Prof. Clarke of New York showing by demonstration and precept many interesting electrical principles. Prof. Clarke gave a practical demonstration of wireless telegraphy, ringing a bell by wireless the length of the hall. He surprised his audience by permitting a 30,000 volt high frequency current to pass through his body, explaining that it is the low frequency currents which kill, and that the high frequency currents, by reason, perhaps, of the extremely rapid vibrations, do not disturb the bodily functions. The speaker showed the Crookes' tube in action, demonstrating the fact of the X-ray by means of a member of the audience who held his hand before the fluoroscope. This was a demonstration to one only, of course, but all could see the glowing vacuum tube or bulb and took the X-ray for granted from the description of the witness. Many, however, demonstrated the X-ray with their own eyes at the X-ray booth in another part of the main hall. The Peter Cooper Hewitt mercury vapor light and various electrical and magnetic experiments completed the lecture. Prof. Clarke accompanied his demonstrations with an interesting running comment on recent electrical discoveries; he showed a metal ball which by means of a powerful

magnet he set whirling in a glass jar full of water, intimating that this experiment might lead to some satisfactory discovery as to the cause of the rotation of the earth. He stated that scientists now had ground for believing that the basis of matter and energy lies in vibrations of widely differing wave lengths; the eye receives vibrations of a certain frequency which manifest themselves as light; the ear receives other vibrations received as sound; the nerves receive vibrations of heat, etc. There are sounds so deep the ear cannot hear them, and notes so high the ear is not attuned to their reception. Perhaps there are forms evidenced by vibrations that the eye cannot see and music all about us that the ear cannot hear. The progress of science tends to confirm, not to demolish, the authority of Scripture.

The technical schools of the Middle West had good exhibits at the show. Among the best of these was that of Purdue University, which showed an ingenious and accurate car testing device for street railways, invented by Prof. Plumb. Other interesting features were the brush testing apparatus and 50,000 volt transformer, invented by Prof. Esterline; apparatus showing the effect of induction and capacity on different frequency currents and also to show electrical resonance, invented by Prof. Matthews. Telephone experimental apparatus was also shown, and charts showing the relative attendance of the five largest electrical schools. It is of interest to note that all the apparatus shown was made by the students at the university. L. H. Perrine was in charge of the exhibit, which was set up by R. W. Harris.

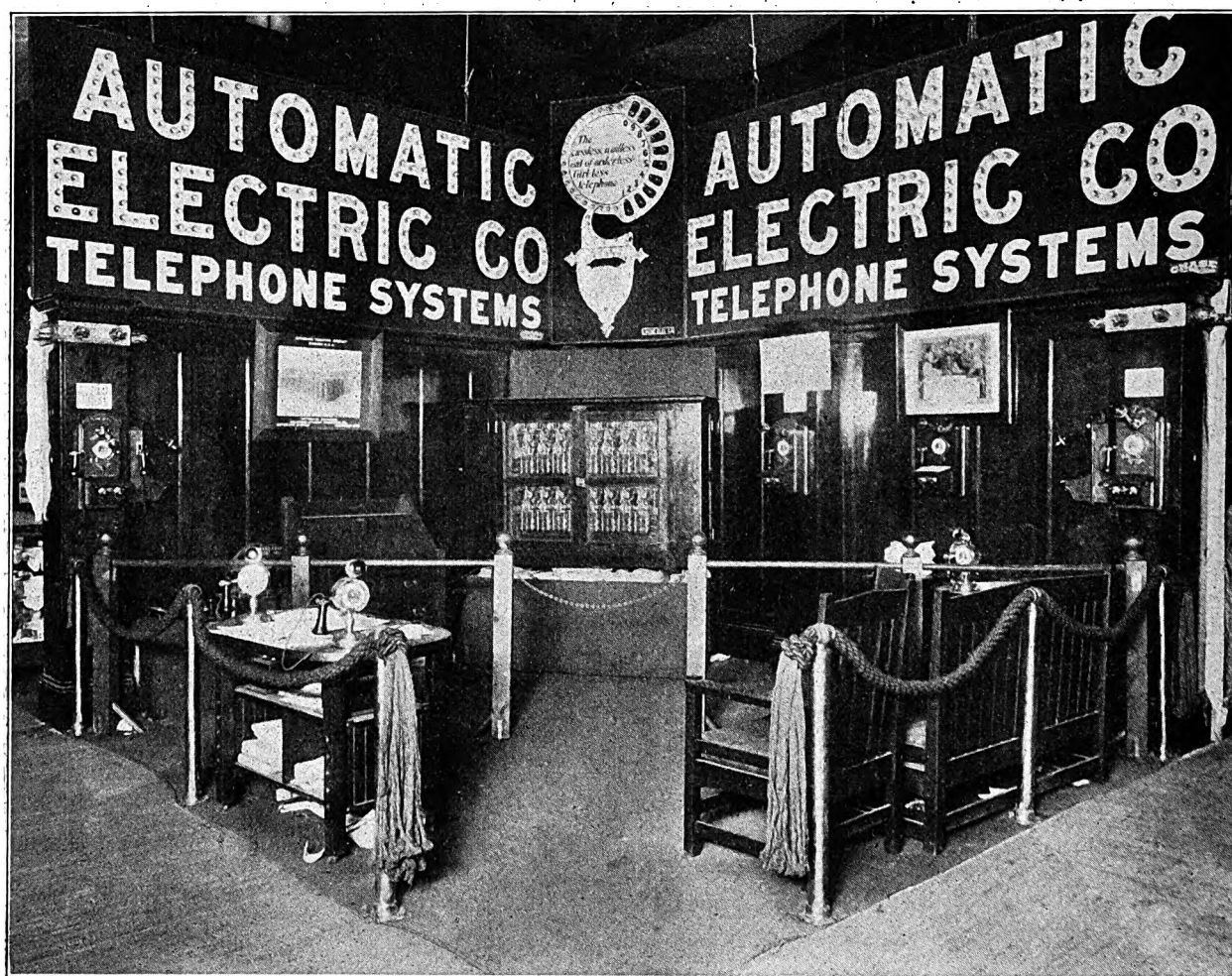
The electrical department of the University of Illinois presented features and views around the university, and showed an interesting oscillograph, demonstrating the wave form of alternating currents. The exhibit included patterns, castings, etc., made by freshmen students. The decorations were college-like. E. I. Wenger and M. K. Akers, both instructors in the electrical engineering department, were in charge of the booth.

Armour Institute of Technology had a very complete exhibit, which was divided into two parts, one of which showed the work of the telephone engineering department, and the other the work of the general electrical engineering department. The former was in charge of Prof. G. W. Wilder, professor of telephony, the latter was under supervision of Prof. Freeman and Prof. Snow. The telephone booth exhibited on a small scale a complete telephone switchboard, but wired horizontally on a table, showing the working of all the parts. Prof. Wilder and students were present to demonstrate the working of the apparatus. The general electrical exhibit was wider in its scope, presenting a view of the work of the institution in the electrical field. The telephone department, however, was most interesting from the viewpoint of telephone men. Standard apparatus was shown and the comparison of different styles and makes of apparatus was not the least of the features.

An electrical furnace, with many interesting high temperature products, such as chromium, which had been fused and volatilized; metallic silicon, graphite and artificial rubies, were shown at the exhibit of the electrical engineering department of the University of Wis-

consin. One of the machines developed at the university is interesting to electrical men, consisting, as it does, of a direct current generator with special connection, giving a low frequency, two-phase alternating current. Other useful instruments developed at the university were shown, with views of the interiors, the buildings, equipment of the department, etc. The department has made electrolytic products its chief topic of interest of late and has developed many things interesting to science in the chemistry of high temperatures produced by the electric arc. The exhibit was in charge of Prof. John W. Schuster, assistant professor of electrical engineering, Madison, Wis.

The exhibit of the Automatic Electric Company at the Electrical Show occupied space No. 20, section C. The back of the space was walled in by mahogany finished paneled walls seven feet six inches high, with square posts at the corners. Above the wall rose two big electrically illuminated signs, those on each side reading, "Automatic Electric Company; Telephone Systems," these two being joined by a smaller panel with the familiar dial of the automatic telephone cut out of wood and outlined by incandescent lamps. This dial was six feet high and the signs were among the most prominent in the building. Within the booth, which was railed off by heavy green cord and brass posts, was located an



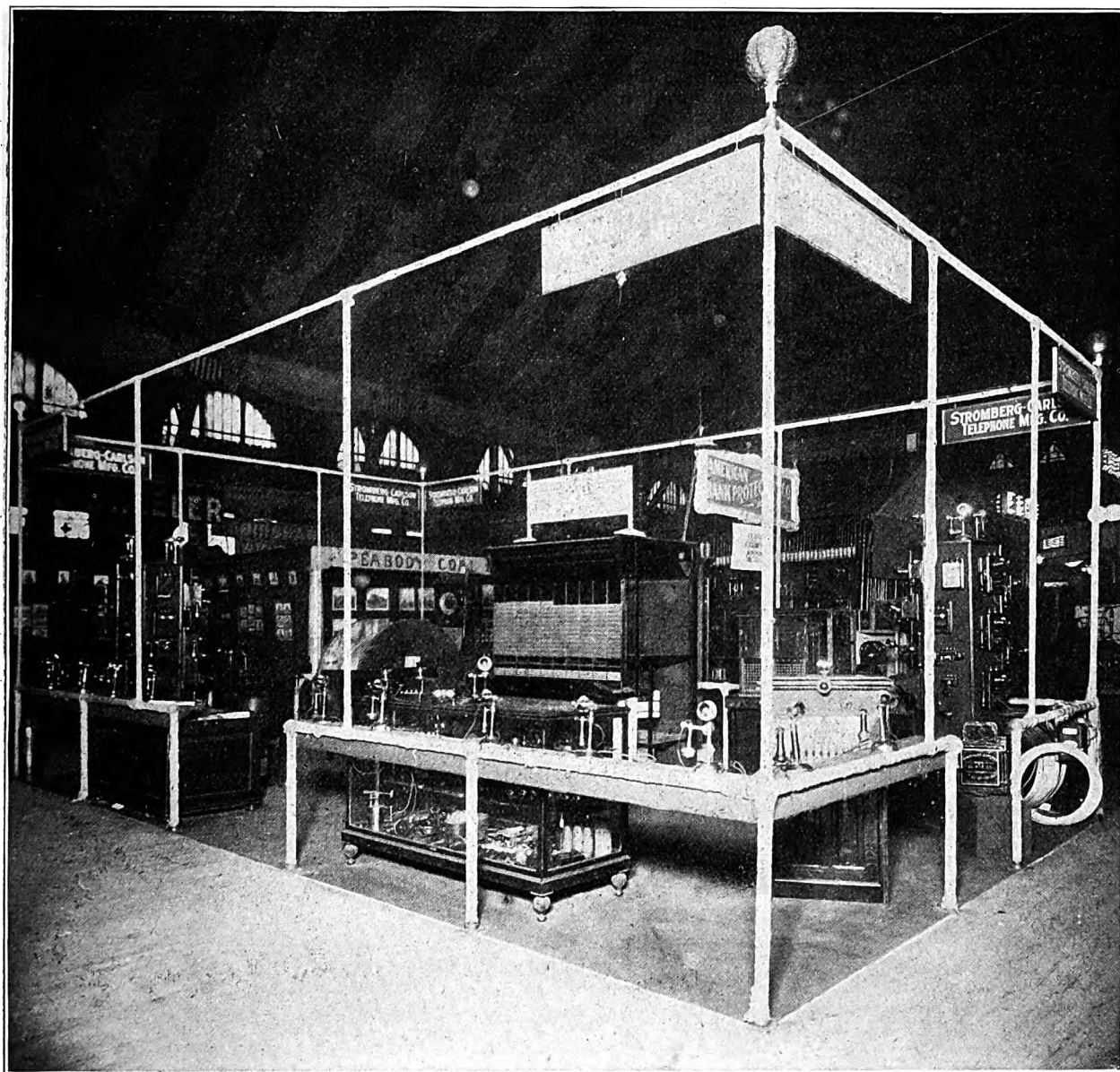
The industrial exhibits were numerous and complete. In the telephone field the chief of these included the exhibits of the Automatic Electric Company, the Stromberg-Carlson Telephone Manufacturing Company and the Swedish-American Telephone Company. These were the largest Independent telephone exhibits shown, but there were many others which will be briefly described in due course and which were equally creditable to the firms represented. The Bell Company was well represented by the exhibit of the General Electric and the Chicago Telephone Company. The allied lines were very well represented at the convention also. Among the best of the allied exhibits were those of Frank B. Cook, the National Carbon Company and the Miller Anchor Company.

Automatic switchboard, exhibit size, of the 10,000 type, to which were connected two straight line wall telephones, two straight line desk telephones and four party line wall telephone. These were operated by the switchboard, and a ringing machine was mounted alongside of the board to furnish ringing power. Power for operating Automatic telephone switches was furnished by a storage battery of 26 cells. The telephone department of the Illinois Tunnel Company also installed in the booth two automatic desk telephones, which were connected with the downtown exchange. The furniture of the booth was all of English fumed oak. The exhibit was one of the most popular at the show and was crowded every afternoon and evening with spectators listening to the explanation of the system and watching the demonstrations.



The Automatic Electric Company distributed at the Electrical Show a new booklet. The cover is of Japanese vellum, on which is reproduced in original tints the grand prize diploma which was awarded to this company at the St. Louis World's Fair, 1904, they being the only Independent telephone manufacturer to be so honored. The booklet contains a brief description of the working system, with pictures and data regarding larger exchanges built by the company and a complete list of the public and private exchanges which the company has built since its organization. In addition, there is an article on tele-

demonstrated to their many visitors the virtues and points of advantage of their instruments, showing a complete line of series exchange telephones, central energy telephones and bridging instruments for party and rural lines, as well as central office equipment. Their new improved compact magneto telephone No. 88 attracted much favorable comment from visiting Independents, and the company states that many good sized orders were secured during the show. One feature worthy of mention was a reproduction of their new factory building. A fac-simile was made up of paper mache and



STROMBERG-CARLSON CO'S. DISPLAY

phone competition and its benefits to the public, which is a clear and convincing argument for the Independents.

The Swedish-American Telephone Company, as shown by the accompanying illustration, was one of the principal exhibitors at the Electrical Show. They were located in section E, space 11 and 12, and made a distinct hit by their original and up-to-date display. Their space was decorated in red and green and illuminated by a liberal number of opalescent and incandescent electric lights, giving a neat and attractive effect. The company

illuminated, giving the effect of being in actual operation. Telephone men visiting the exposition, who failed to visit the new plant of the Swedish-American Telephone Company, were given some idea of the size of the concern by the display above mentioned. Souvenir postals were given out which contained the likeness of a charming young lady using one of their portable desk telephones. The quarters of the Swedish-American Company were spacious and roomy, generously provided with mission chairs for the comfort of their friends and



customers. A long distance telephone was also provided, which was found to be very convenient for visitors as well as for those occupying booths near-by. The exhibit of this enterprising concern was comprehensive and complete and was one of the most original and tastefully arranged displays of any in the exposition. The interests of the company were looked after by courteous salesmen, obliging and clever at all times. Great good will flow to the Independent interests through the exposition. Many thousands of people have learned to their surprise the strength of the Independent movement. The Swedish-American Company deserves much credit for its active work in this connection.

aerial and underground, and telephone construction material and supplies. The character of the exhibit evidenced the high place the company holds in the manufacture of Independent telephone appliances. The center of attraction in the exhibit was a section of the largest switchboard in the world—one of the forty-nine sections now under construction for the St. Louis office of the Kinloch Long Distance Telephone Company of Missouri, with present equipment of 12,500 subscribers' lines and 740 trunk lines. Prominent telephone exchange managers, engineers and investors in telephone securities, who gave this piece of apparatus a thorough examination, were convinced that telephone properties with



An exhibit deserving of especial mention was that of the Stromberg-Carlson Telephone Manufacturing Company. Its attractiveness and popularity were made evident by the constant throng of visitors who passed through its three entrances both day and evening. The full line of apparatus gave the visitors an opportunity to investigate the telephone art in its present high state of efficiency. The exhibit comprised switchboards and telephones for the largest exchanges, small central energy and magneto exchanges, private branch exchanges and rural lines; telephones for interior systems used in stores, factories and residences; mine telephones, interurban street railway telephones, etc.; also telephone cable,

such equipment would be a good investment. The company was ably represented by Mr. J. P. Cracraft, general manager of the western office, assisted by M. S. Conner, chief engineer, C. W. Schafer, A. O. Stigberg, E. C. Lewis, E. A. Reinke, H. J. Wilms and J. H. Wagner, all of the Chicago office, and state representatives William Bowen, Iowa; J. J. Nate, Minnesota; Paul D. Myers, Illinois; E. P. Shafer, Indiana; A. B. Smith, Michigan; D. C. Gould, Nebraska, and J. B. Wilkinson, Kentucky.

Frank B. Cook's exhibit was not one that attracted the general public. Had Cook's big double booth not been directly in front of the band stand, it is doubtful whether there would ever have been a crowd around it,



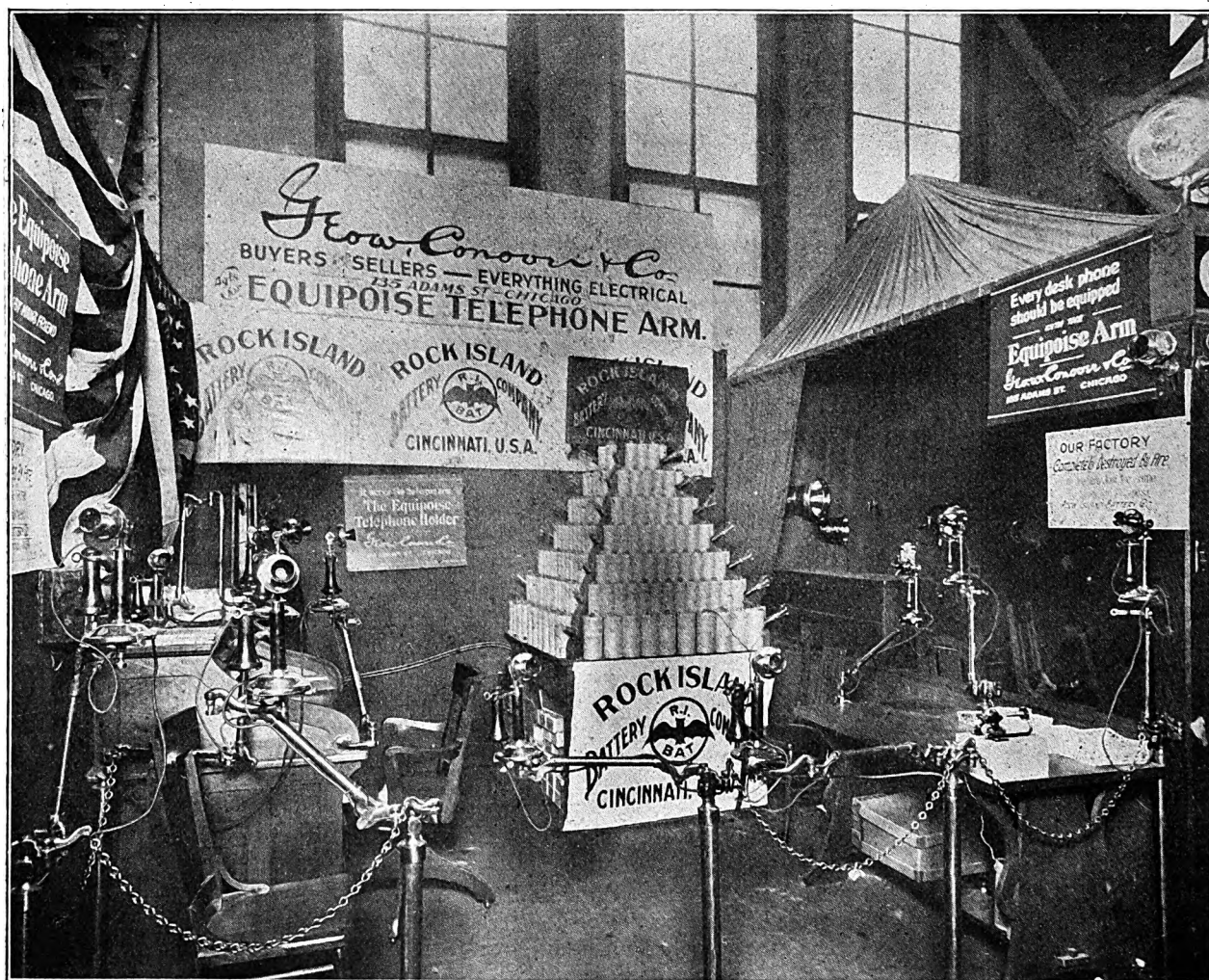
sets were included, also an adjustaphone attached to the Burns patent extension arm. A small model of a hotel switchboard was included, also an automatic plug phone, in which the operation of hanging up the receiver throws the plug out of commission, constituting a lockout on the plug.

The display of the Electric Appliance Company consisted among other things of a line of series and bridging 'phones, showing a new type of laminated armature having no center shaft, giving a large winding face. Telephone men manifested considerable interest in these features, also in the "Eaco" automatic 'phones for factories,

and like products. The center of the display consisted of the largest dry cell in the world, nearly four feet high, "one and one-half volts, 1,000 amperes." Around this were grouped smaller dry batteries in various sizes.

Roth Brothers showed a general line of dynamos and motors and for telephone use presented charging sets for batteries, also a ringer, with howler and busy attachment. A good general view of their booth is presented in the accompanying illustration.

The large booth at the south end of the hall included three firms, all of whom were interested more or less in the presentation of electric signs. They were the Haller



SOME ROCK ISLAND DRY BATTERIES

residences, warehouses, apartments, etc. Among the other features, the company had on display the Sandwich Pole Changer, Illinois Ohm-meters, duplexers, Paranite wires and cables, and 1900 dry batteries. S. A. Dinsmore was in charge of the exhibit, assisted by H. N. Remington, E. C. Brown, J. B. McMullen, A. W. Bryant and P. R. Boole.

The Metropolitan Electrical Supply Company showed a line of dry batteries and small motors, electric signs, etc., etc.

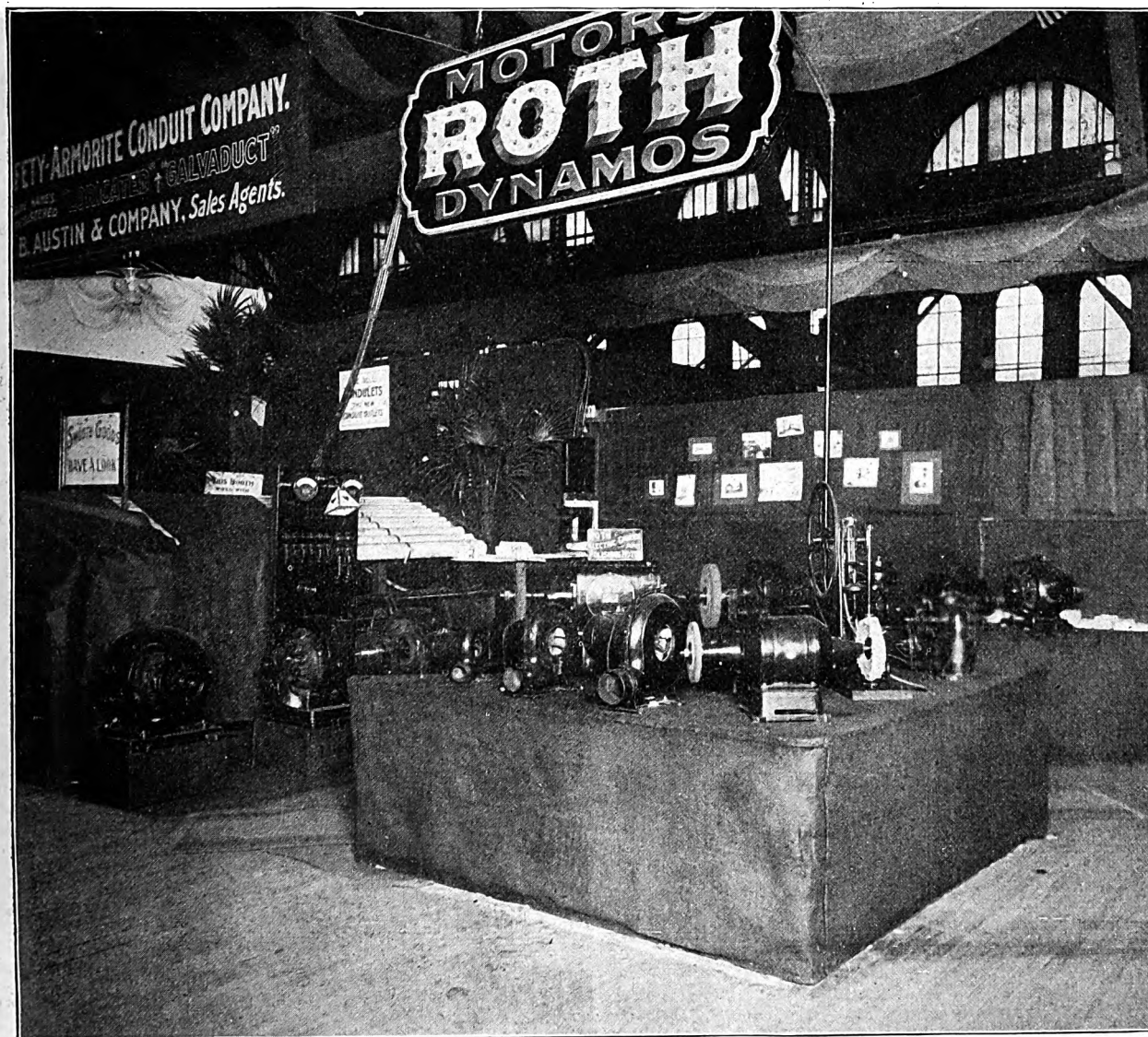
The National Carbon Company had a peculiarly handsome booth, fitted up in dark colors. The basis of the display consisted of dry batteries, housed in an ingeniously arranged miniature structure built of crucibles

Machine Co., Dull's Flasher, and the American Electric Supply Company. These companies presented a wide variety of electric signs and other devices, many of which are suitable for advertising telephones.

The General Storage Battery Company of New York presenting batteries for all classes of electrical work, had an especially attractive exhibit. This company manufactures storage batteries for all purposes where such batteries are indicated. At the electrical show the principal display consisted of the Bijur "high duty" storage batteries, used principally in power work. The company, however, manufactures storage batteries for central energy telephone plants. These are standard goods and among the best to be obtained.

The Central Electric Company of Chicago showed a variety of electrical and telephonic apparatus handled by the company. One of the features of the display was the Warner Pole Changer; the Warner Dry Battery Outfit, which was also displayed, was another. The Okonite rubber tape and the Manson Friction tape were shown, also the Reco sign flasher, with double pole switches. The company showed to advantage a line of Williams-Abbott telephones, interior telephones, generators and testing instruments, Edison primary batteries and Can-dee patented pot heads. Their exhibit was one of the most interesting at the show.

wire of all kinds, cable, etc. They furnished, by the way, all material used in the construction of the Lincoln, Neb., and Sioux City, Ia., plants. The illustration shows some of the features of their exhibit, also that of the Rock Island Dry Battery Company of Cincinnati. Messrs Conover & Co. were represented at the show by Geo. W. Conover, H. S. Durant and H. S. Conover. The Rock Island Dry Battery Company, whose exhibit is clearly shown in the picture and which attracted much attention and favorable comment, was represented by M. A. Loeb, general manager. In this connection it is interesting to note that the fire which on the night of Janu-



The Miller Anchor Company's exhibit was in charge of Mr. Miller in person, who showed to good advantage the various anchors and boring tools manufactured by his company. Not only were the anchors shown, but also the regular and combination augers for boring holes into the earth for the accommodation of the anchors. The Miller company manufacturers a galvanized iron bucket which may be used ingeniously in the making of anchor or other holes. Powerful rock augers and a useful horizontal earth auger were also shown.

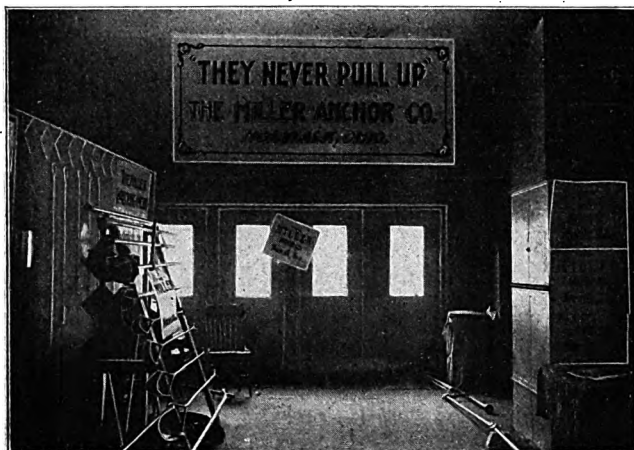
George W. Conover & Co. presented a line of telephone materials, including cross arms, pins, insulators,

ary 11 last, destroyed the fine new factory of the Rock Island Dry Battery Company, 456 to 462 East Sixth street, Cincinnati, in no way interfered with their exhibit at the Electrical Show, nor did it materially retard the progress of the company's business. A hurried meeting of the board of directors was called while the fire was still raging and a decision was immediately reached to carry on the business on a more extensive scale than ever. Hardly had the embers cooled before an immense new factory building at Ninth and Sycamore streets had been leased and the work of equipping it for the manufacture of dry batteries was at once begun. The com-



pany was in a position to fill all orders without delay on February 10.

The Monarch Electric and Wire Company, whose handsome exhibit attracted much attention, was represented by L. Schwab, vice-president.



PART OF MILLER ANCHOR CO'S BOOTH

The exhibit of the A. H. Andrews Company of Chicago attracted the attention of nearly everyone who passed by the SOUND WAVES booth, where the Andrews metal furniture was best displayed. The practical utility of the Andrews goods, their strength, lightness, beauty and economy, and the variety of designs and styles, making them appropriate for almost all the purposes for which furniture is necessary, proved a feature of irresistible attractiveness to many people, not only among business men and managers of companies, but to the public also.

The Central Electric Manufacturing Company, Rock Island, Ill., exhibited a line of Black Hawk dry batteries. The exhibit was in charge of J. L. Haas.

The M. B. Austin Company of Chicago, made its leading exhibit the well-known line of iron conduits for which the company is famous. A. H. Friend was in charge.

The Nungesser Electric Battery Company's very creditable display was presided over by the western representative, Thomas Greer.

The Star Electric Company, H. H. Albert, representative, showed the Diamond S. S. Dry Batteries and testing apparatus. The General Storage Battery Company, whose interesting display attracted the attention of technical men, was represented by R. C. Shaal.

Thordarson's exhibit at the north end of the hall held more interest for the public at large, apparently, than almost any other. His electrical and magnetic demonstrations, while among the A B C experiments to electrical men, caught the eye of the people nevertheless. A really interesting feature, however, was the electric spark, more than six feet long, which passing across a lettered screen, produced an excellent imitation of lightning, and caused a tremendous racket at the same time.

The American Conduit Company had an elegant booth at the Show, and was represented by A. L. Waterbury, who was enthusiastic concerning the results of the exposition. The company exhibited some fine examples

of fiber conduit, which were the feature of the exhibit.

The McRoy Clay Works of Chicago enclosed their space on two sides by a wall of clay conduit in large and small sizes. There were many handsome photographs on the wall of this booth showing conduit construction work.

If the reader will turn to the large view of the exposition hall he will note at one end a series of concentric circles resembling a target. This photograph is evidently a time exposure. The circles are really a star composed of many electric bulbs. As it was revolving rapidly when the photograph was taken, the effect of a series of circles is manifested.

The Electrical Trades Exposition Company is to be complimented upon its enterprise and the features of interest provided for the public. Suitable metal souvenirs were given out on the special days, which included Franklin Day, Thomas A. Edison Day, Electrical Workers' Day, three Telephone Days, Professional Day, Clergy Day, College Day, etc.

The Exposition Company gave a banquet Friday evening, January 26, to the exhibitors. The dinner was held at the annex hall of the Coliseum. Samuel Insull, president of the Electrical Trades Exposition Company, acted as toastmaster. Speeches were made by Messrs.



ELECTRIC APPLIANCE CO.

Niesz and Mercein of the Electrical Trades Exposition Company; Odell of the DeForest Wireless Telegraph Company; Overshiner of the Swedish-American Telephone Company; Steward Spalding of the Coliseum Company; Gentry, of the American Telephone & Telegraph Company; Burley Ayres, of the American Steel and Wire Company; McQuiston, of the Westinghouse Electric and Manufacturing Company, and others.

**SOUND WAVES Advertisements Bring Results.**



multiplying power of ten, that is one which has one-tenth part of the resistance of the voltmeter coil. In applying a shunt to a voltmeter, the total current must equal the current flowing through the shunt plus the current flowing through the voltmeter. Then the current flowing through the voltmeter is equal to  $E \div R_v$  and the current flowing through the shunt is equal to  $E \div R_s$ . The current flowing through the voltmeter is proportionate to that flowing through the shunt and vice-versa. The proportion of the current flowing through the voltmeter is equal to  $\frac{R_v + R_s}{R_s}$ . As we desire

a shunt with a multiplying power of ten  $\frac{R_v + R_s}{R_s}$  can be said to equal ten. Substituting the 2,000 the resistance of the voltmeter coil for  $R_v$ , we have  $\frac{2000 + R_s}{R_s} = 10$  or  $9 R_s$ . Therefore  $2,000 \div 9 = 222 \frac{2}{3} R_s$ , or 222 ohms the proper resistance for the shunt.

Now the combined resistance of the voltmeter and shunt would be equal to the reciprocal of the sum of the reciprocals of the resistance of the shunt and voltmeter coil. Then the following calculation is approximately correct—

$$\frac{222 \times 2000}{222 + 2000} =$$

approximately 200 ohms for the combined resistance of the shunt and voltmeter in multiple. Ascertaining the drop of voltage across the shunt, the drop across to ground must equal any difference.

Assuming that the drop across the shunt equaled 13.5 volts or 135 one-tenth volt divisions, then the drop across to ground must equal .1 volt, therefore the resistance of  $R$ , or the measurement would equal  $\frac{1}{135}$  of 200 or 1.48 ohms.

By employing the shunts, the voltmeter can be used in absence of an amperemeter to determine the amount of current flowing. The method is a resultant of Ohm's Law  $C = \frac{E}{R}$ .

For example take the low scale shunted with the 222 ohm coil, and assuming that we obtain a reading of 3 volts around the shunt, then according to the formula the following calculations hold true:

$$= \frac{3 \text{ e}}{222 \text{ r}} = .013 \text{ amperes flowing in the circuit.}$$

The adaptability of the voltmeter during tests should not be lost sight of, as its size and compactness recommends it in many instances over other methods. By its continued use the "tester" will become acquainted with many different methods of applying it to locate the various kinds of trouble. In conjunction with the voltmeter tests it might be well to arrange an equivalent scale, similar to that shown in Fig. 7, by which it would be possible to learn at a glance what amount of resistance was being measured when a certain needle deflection occurs. If a Wheatstone bridge is available one can utilize the resistance coils in this to determine the equivalents, otherwise they will have to be figured out.

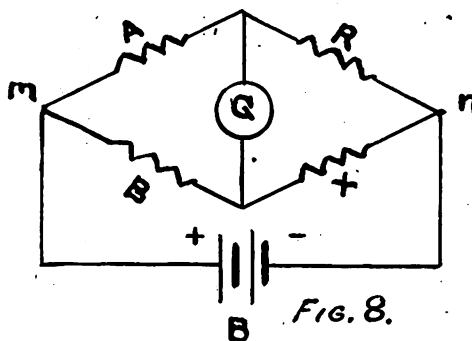
Quite often in ordinary exchange practice it becomes necessary to make tests in which accuracy means much, for instance in faulty cable conductors, and in such tests as these some apparatus involving the principle of the Wheatstone bridge can best be used. There are many simplified pieces of apparatus on the market today which

involve this principle, notably among which is the ohmmeter. The ohmmeter readily commends itself in a great number of different tests and is superseding the bridge outfit in portable work to a large extent. However, in most permanent test desks the bridge is still an important piece of apparatus. In taking up the principle of the bridge it is the intention of the writer to briefly mention the methods of locating grounds or crosses by the Varley arrangement. The subject of testing is a very broad one, and can best be studied in treatises on that subject alone.

There are several books which treat the subject of testing in such manner that the student will soon grasp the whys and wherefores of the different formulas, then experience will accomplish the rest.

In Fig. 8 is shown the ordinary circuit arrangement of the bridge during a resistance test in which  $X$  is the unknown resistance.

The principle governing the bridge depends on the relation that divided circuits bear to each other. For in-



stance, if a current has two paths provided for it to flow over, one path being 10 ohms in resistance, while the other has 100 ohms resistance, there would be a flow of current ten times the amount in the low path more than would flow through the high path. Now by placing a galvanometer between the two paths, the needle would have a tendency to stick to one side or the other, depending on the direction of the current flow through the galvanometer, but if the current flow over each path is equal, the effect in the galvanometer is nil. Thus by means of the galvanometer it is possible to ascertain when the different bridge arms or paths are in equal proportion to each other. Now referring to Fig. 8 again, the current would flow over the three arms of the bridge and  $X$ , and, providing that the  $R$  arm bears the same relation to  $X$  as the  $A$  arm does to  $B$ , then no galvanometer deflection will occur, indicating that a balance was obtained. The ratio arms,  $A$  and  $B$ , in some bridges are arranged with four plug holes each reading 0-10-100-1000 ohms, while the  $R$  arm is provided with four rows of resistances, starting at 0 and reading to 10 in one ohm steps, then starting at ten and reading to 100 ohms in ten steps, then starting at 100 and reading to 1,000 ohms, thus giving the  $R$  arm a total of 11,110 ohms. Such a bridge is capable of reading resistances from .001 of an ohm to 1,111,000 ohms. In the later form of bridges many improvements have been worked out, notably among which is the reversing commutator by which the relationship of the bridge arms to each other can be instantly changed. In all cases  $X$  is the resistance to be determined. Now for example, suppose that we have 100 ohms plugged up in  $A$  arm and 1,000 in the  $B$  arm, and that by adjusting the  $R$  arm we find the needle re-

mains at zero when 20 ohms are plugged up in this arm, then according to the formula  $X = \frac{B}{A} \times R = \frac{1000}{100} \times R^{20} = 200$  ohms, the resistance of X.

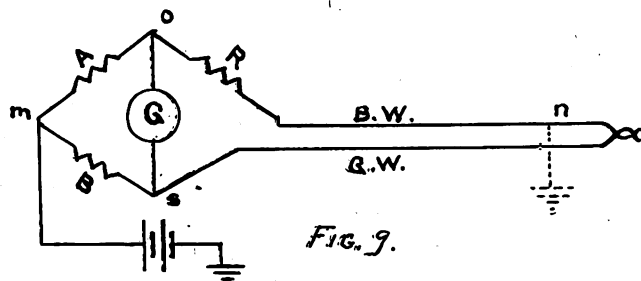


FIG. 9.

After learning how to arrange and compute the bridge results during the measurements, one should become familiar with the methods of making the Varley tests for grounds and crosses. These will be briefly described. In making a Varley test for grounds it is necessary to have one good conductor which is usually available in telephone work as the wires are usually in pairs of the same size and resistance.

In the short-cut method described in connection with this test it is necessary that the wires be of the same size.

In Fig 9, is shown the circuit arrangement of a Varley test for the location of a ground. The good wire is designated G. W., and the grounded wire is designated B. W. As shown, the two distant ends of the wire are connected together. Now arrange the A and B arms so that they are equal in resistance, then adjust the R arm until no deflection occurs when one-half of the resistance plugged up in the R arm is equal to the resistance from the fault to the distant end. Knowing the resistance per

mile of the conductors under test, the distance in miles can be easily computed, but in making the test in this manner it is possible to err one-half ohm either way, because the smallest possible change in the R arm would be one ohm. If a perfect test is required the ratio arms will have to be adjusted and the regular formula applied.

The Varley test for crossed lines is made in much the same manner with the exception of the battery arrangement, which is connected to one of the crossed lines instead of earth, the other two conductors being connected to X. The circuit shown in Fig. 10 is the ar-

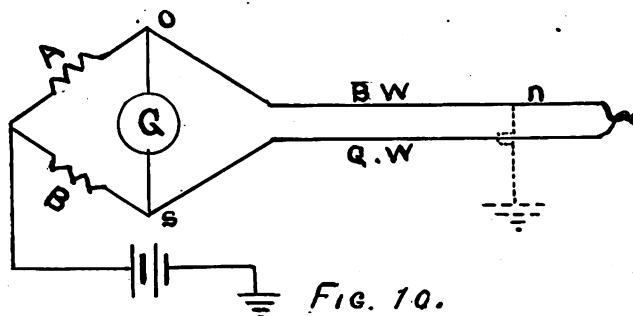


FIG. 10.

angement of apparatus during the Murray test for grounds, this being adaptable when one has a galvanometer and resistance boxes.

In conclusion I can say that in order to apply a test set to the best advantage in a telephone exchange, it becomes necessary to obtain constants of the different lines from time to time. This being recorded along with such notes as may be obtained at the actual clearing of the faults, will form valuable data which can be utilized in locating future trouble.

(Finis.)

## Useful Co-operation

BY W. C. KERR, IN THE ELECTRICAL JOURNAL

(Continued from February Issue.)

There are some things which distinctly make against co-operation. One is the mood of the man who is looking for trouble. Another is the characteristics of a man who is ultra-sensitive. Another follows from reticence, which of itself is not harmful, but which is a fruitful source of misunderstanding. The greatest is jealousy, personal and corporate.

Good memory has its advantages, but every man should be a good forgetter. A bit of reflection will show that many unsatisfactory events can never be cleared up, and life is too short to apply the last analysis to everything. Don't emulate Henry Ward Beecher's dog that chased a squirrel through a knot hole in a high board fence and stood there barking; then returned every day thereafter and barked a while at the hole.

It would be impossible in one short address to clear up the subject of co-operation and fit it to the many who must practice it. It would likewise be impossible to shape many minds to some rigid ideal of co-operation. It is my belief that the desired end can only be gained by a series of approximations, in which considerable patience

needs be exercised, with much charity and some disappointment; while in the counteraction of reprehensible impediments, strong language and acts are warranted.

I believe it is necessary for our interests and every man in them to acquire a high ideal of co-operation, and not a limited, narrow, and selfish view. Without this, it cannot prosper. There is no difficulty in right-minded men acquiring this standard.

In detail application, the problem is more difficult. With our personal limitations and shortcomings, we can only approximate a fair result, but through patience, principle, and motive this practice can grow better every year until in fair season we will have a co-operation which in terms of usefulness will probably have an efficiency quite equal to that of any apparatus with which we deal. If any man's co-operative efficiency is low, he had better regard it in exactly the same light as he does any deficiency which is equally wasteful, and that too before he is reminded of it.

Why this co-operation? Why not split apart and each go our own way; not making the effort or the struggle for these things which I have tried to plainly state? Why not? The answer is, that is another way, which also



has some merit. In fact, so much could be said in favor of it, that, without attempting a firm opinion, I am inclined to think that a consistent segregation of interests, with no attempt whatever at co-operation, would be better than any unreal, unsystematic, and half-hearted attempt which in the name of co-operation could only be a dangerous ally or a treacherous friend. We must have the real thing or nothing, and it must extend from the top to the bottom.

The head of our associated interests has long desired this real co-operation—the useful kind. He has done all he could to inspire. It is impossible to expect that his time can be given to its conduct, or even its general guidance. The officers and managers in authority in the various departments of his concerns must make it a burden upon their minds, a mission in their hearts, a motive in their life's work, and then we will get a fountain from which something will flow.

Meanwhile there is no use blaming the lesser lights for failure to co-operate if they see no very brilliant co-operative stars in the constellations above. This problem is right square up to every one of us, and it is also up to us to take a bit of what is briefly known as backlash in connection with it. We should have no feeling of resentment towards one who says we did not co-operate in a given matter. If we think we did, we should try to state why. If we think we did not, or if we have done something inadvisable, we should do the best we can to correct it. If in our interests there should be more plain talk and less imagination, more accuracy and less misinformation, haziness, and half-answer; more confidence and no jealousy; more of the spirit of the real desire to be helpful and less of selfishness; we would more nearly fulfill the ideals which our leader has in mind when he urges co-operation between those who are working in his interests.

Admitting one selfish thing, it may be said that certain benefit comes to the man himself whereby for his own personal interest he can afford to pay heed to these things, independent of the good it does his concern. But far above this there is a trust imposed upon every man who works for an aggregation such as our lot is cast with.

If any one does not think so, he had better get out and work for himself. When working in a big interest like this, you are working for it and not for yourself. You may be rewarded on merit or otherwise, and your virtues and abilities may be appreciated in some form or another, but you can't get away from the fact that you are not working for yourself. You are working for a complex and extended interest, one part of which pays your salary and all of which is what has been created by one man in forty years. If you can't work with all this interest and for the interest of it all, you are doing just that much less than your full duty. You may have a hundred acts to perform for your own organization to one that you need do for any other, but that one is of added importance, because its rarity makes it a large percentage of the total acts of like kind you will ever have opportunity to perform.

There is a wrong notion in the world as to the sequence of some things. You must first perform and re-perform and prove that you can perform and keep it up before you will get credit for performing. A large proportion of people in the world can't do certain things because they never tried, and many have thought they could not because they did not do very well the first time they tried. There isn't anything pertaining to the general conduct of himself in the world that a man can't do, and any man will make of himself just what his motives lead to. Consciously or unconsciously, his motives make him, and his practice will follow from what he has been made. Therefore useful co-operation must first rest on the underlying principles of co-operation. It must then be made individual within every man, practiced daily, and followed with persistence until we have the kind of co-operation which will usefully serve all these associated interests, and which is the kind that Mr. Westinghouse wants.

[The foregoing paper was read at a meeting of the district managers of the Westinghouse Electric & Manufacturing Co., and is reproduced here by permission of the publishers of the *Electric Journal*.

## Telephone Troubles

BY H. P. CLAUSEN.

In the preceding article the writer discussed the matter of cord and line reversals as representing difficult cases to locate, and it may be interesting to record another case in which the complaint was that at times a booth telephone could not be connected with a regular line circuit. In fact, the operator was, at certain times, unable to get into communication with the party in the booth, which was located in the exchange office.

After some correspondence, which really resulted in making the matter appear still more complicated, it was found that the system was entirely metallic, that there were no grounds on the booth circuit, and that certain answering cords could be placed into the booth line and operate successfully. And, again, certain calling plugs might be inserted into the booth line and operate successfully. And at other times it was impossible to obtain the connection, unless, say, when an answering cord were first selected and placed in the booth circuit

and no service obtained, then the companion plug could be placed in the booth plug and operate successfully, while the answering plug could then be inserted into another line jack and everything "work fine."

Now here was a case in which some answering cords and some calling cords could not be used for connecting the booth line with a subscriber's circuit. And, further, when a certain plug was selected and it was found that connection could not be obtained with the booth line, then the companion plug could be used for the service. Further, all lines were metallic, and all cord circuits were clear from grounds.

Now how could this case of trouble be located from a distance, and by correspondence?

It transpired that the spring jacks in the switchboard were of the type in which an answering plug, when inserted in the line jack, connected together two springs and shunted out the line signal, while, the calling cord, being of the short tip type, left the line signal in circuit

to serve as a clearing signal, and the difficulty was caused through the switchboard man having used the line drop coil for a more important place than in the booth telephone circuit.

This, fact, of course, explained why, when the short tip plug was inserted in the jack, the booth telephone circuit stood open, but it did not explain why some answering cords showed up this defect of open circuit, as well as some of the calling plugs, until the second complication was found to consist in some of the short tip plugs having been used as a calling plug, and in some cases, the long tip was used for calling service.

This, of course, also explained why an answering cord, (a short tip plug) when inserted into the booth line, left the circuit open, and when the companion plug (a long tip plug) was inserted into the booth jack, the circuit was completed.

The writer recites this case of trouble simply to show how easily an experienced trouble man would locate the difficulty, provided he was on the ground and in position to examine the circuits.

But what a mysterious case this complication of difficulties must present to the inexperienced trouble man who has not had the same case before.

What explanation could one offer as the cause of a difficulty expressed as follows?

"Our line is of the bridging type. We can ring central without any trouble, and speak to them, but unless central calls us within fifteen minutes after, we have called central, then central is not able to ring our bell."

A complaint of this kind does not give one a good "holt" on the case, but it is easy to clear the trouble after we discover that the permanent magnet on the ringer of the telephone ceased to be a permanent one. i. e., most of the magnetism had left the steel bar, but when the local telephone user drove his bridging generator, it magnetized the not too well annealed core of the ringer magnet sufficiently well for permitting the central to ring his telephone, provided central sent current over the line before the residual magnetism was lost.

Another case which occurs sufficiently often to be a familiar one, is generally expressed as follows, particularly when applied to a heavily loaded bridging line:

"Our telephone bell does not ring between sunset and sunrise, although it rings very well during the day."

When you advise your correspondent that there are too many leaves and branches of trees bearing on his line wires, he does not understand why dampness of the night air crosses his lines more through the leaves and branches than they are crossed during the day.

Of course, this is a case where the partial cross already existed, and the circuit was not working at its best, but when we add to this dampness, it is just sufficient to pass the critical point and interfere with the reception of signals at certain stations.

Storage batteries, as a rule, are not understood by the average magneto telephone trouble man. In some instances surprise is expressed at a manufacturing company sending storage batteries which will not keep their voltage up to the 2.6 volt charging potential. The complaint being that they generally drop to 2 volts.

Let us take another case where an equipment of 10 storage batteries: (In this particular case, 280 ampere hour capacity) were sent to a company with the understanding (his suggestion) that he would charge these batteries from the street railway circuit. Assurance be-

ing given that the batteries could be charged from the 500 volt circuit without any difficulty—with the only bad feature that considerable current would be lost through heat. After the batteries had been installed, a letter was received by the manufacturing company advising them that the street railway company objected to charging the storage batteries from their circuits. This looked like an easy case. It was only necessary to explain to the telephone company that the street railway company's objections were uncalled for, and that further details should be supplied to the manufacturing company as to the specific nature of the objections from the street railway company, and the response was about as follows:

"When we connect the 500 v. wires to our storage batteries, the batteries boil fine, but the street railway company's engineer complains that every time we do this, it stops their street cars."

Now, perhaps, the manufacturing company was at fault in not stating that the 500 volt leads should be connected to the batteries through some sort of a resistance.

### Texas Independents Active.

The Texas Consolidated Long Distance Telephone Company is the title of an Independent corporation which has secured a long distance franchise at Dallas, where the company is now building. E. W. Dunaway, president of the Texas Independent Telephone Association, is interested in the company and engineered the laying and distribution of the cable in the city of Dallas.

The company is building a line from Dallas to Fort Worth, which gives them connection in the Independent field with lines running into that city. They will build from Dallas to Greenville and from Greenville to Paris for the northern connection of the state.

At the last annual meeting of the Inter-State Telephone & Telegraph Company, the seventeenth regular quarterly dividend of 1 per cent was declared on the entire capital stock of the Inter-State Company. The report for the fiscal year ending June 30th also showed an increase of nearly \$20,000.00 in the surplus over and above fixed charges, including interest and dividends, which was considered by the full board to be very satisfactory.

John J. Reilly, receiver of the Independent Consolidated Telephone Company, of Milwaukee, Wis., has sold the entire assets and plant of the company at public auction. The book value of the assets of the company is about \$274,000, and represents the combined value of several Independent companies that were operating in the southwestern part of the state. The company has a bonded indebtedness of \$40,000.

The Atlantic Telephone Company is willing to pay New York City \$7,750,000 cash and give it the free use of one thousand telephones for twenty-five years, in return for a franchise.

Work has been begun at Portland, Ore., by the Empire Electric Co. Mr. Zahn is engineer, Mr. Godfres, general manager, and Mr. Summer, formerly of Ohio, is president.

The Mississippi Valley Telephone Company will construct conduits for all its wires in Muscatine, Iowa.

# How to Secure Efficiency Among Operators

BY MISS T. BARNES

The art of how to secure a high standard service in the operating room has been much thought of and written about.

Some weeks ago the Inter-State Telephone Company of Springfield, Illinois, was honored by a visit from several prominent men in the telephone field. They spoke in very complimentary terms of the efficiency of the service in the operating room, declaring they had never seen anything to equal it in the many exchanges they had visited in the course of their travels through many large cities in the United States, Great Britain and Canada.

As they entered the operating room, they marveled at the quietness that prevailed. At this time many of the operators were answering from 200 to 250 calls an hour. There was no sound of voice to be heard, owing to the careful training in voice culture the operators had received. Each operator worked with speed, at the same

ators; under eighteen they are apt to be irresponsible while over twenty-five they do not take up the work so readily or acquire the speed that younger girls do. They are more set in their ways and not fond of taking up new ideas for the betterment of service.

## TRAINING OF STUDENTS.

The training of the students is the next important step. For the first three or four days they listen on a position with an experienced operator in order to train the ear to become accurate in hearing.

## VOICE CULTURE.

Then the training of the voice and teaching them the correct phrases to use in answering calls, is taken up. It is best to use a certain form of phrases and allow them to use no other in answering calls as this permits them no opportunity to give impatient or impudent responses. The training of the voice consists in drilling them through the transmitter on the phrase lessons, teaching them the proper inflection and how to throw the voice into the transmitter so that the subscriber will hear it distinctly and still no sound of it be heard in the operating room. Each operator, whether experienced or not, takes these phrase lessons four or five times a day and their voices in time become exceedingly soft, sweet and low. As every phrase is a question, they are taught to use the rising inflection. The chief operator or assistants are on the monitor every minute of the day. If an operator loses the proper control of her voice or does not use the correct phrases she is given a lesson immediately. It is almost impossible to distinguish one voice from another after they have been trained for a time. A traveling man said recently that in all the course of his traveling career, he had never seen anything to equal the courtesy and the sweet, soft voices of the Inter-State operators at Springfield, Illinois.

During the last State Fair, the business men decorated their windows and went to no little expense to attract the eye. The Inter-State Telephone Company had a little plan of their own to attract the ear. A voice contest was opened and prizes awarded to the two operators having the sweetest and best controlled telephone voices. The first prize, a beautiful gold watch, was awarded to Miss Mary Hartter. It bore the following inscription: "Awarded in prize contest to Miss Mary Hartter by Inter-State Telephone Co., Oct. 15/05." The second prize, a \$5.00 gold piece, was awarded to Miss Dora Stork. This contest closed the Monday after the State Fair. The decisions were made by the reports of the solicitors, collectors and by the daily department card. The company reaped good results from this contest. The State Fair is the most trying period of the year, it brings so many strangers to the city and the telephone is in more demand then than at any other time during the year. A different and greater variety of people are to be dealt with, and it takes more patience to handle them than the regular subscriber. The operators put forth every effort to be the prize winners. Thus it is easy to see



MISS T. BARNES

time handling the cords with perfect ease and quietness. They seemed unconscious of the fact that visitors had entered the room.

The method used in obtaining these results was explained as follows in answer to the many questions that were asked.

## GIRLS OF GOOD CHARACTER.

In the selection of girls for operators, great care should be taken to know positively that they are of good character, as experience has proven that girls of good character are more apt to have the company's interest at heart.

## AGE.

Age must be taken into consideration; girls between the ages of eighteen and twenty-five make the best oper-

that the results were more than satisfactory to the company.

#### DEPORTMENT.

Deportment is a point which is strongly emphasized in the operating room. A daily deportment card is kept by which the hours and salaries of the operators are regulated. This card has incited the girls to feel a greater interest in their deportment than they would

	Highest Speed .....	Attendance .....	Late .....	Opening Keys .....	Disorderly-in Building .....	Whispering .....	Handling Cords .....	Correct Position .....	Talking to Subscribers .....	Busy Line .....	Voice Development .....	Correct Phrases .....
Dora Stork .....												
Marjorie Paddock .....												
Bickie Daughton .....												
Mamie Finnigan .....												
Ella Berry .....												
Jennie Berry .....												
Mary Hartter .....												
Jennie Cargill .....												
Eva Fowler .....												
Louise Church .....												
Elizabeth Finnigan .....												
Lois Fox .....												
Eva Fox .....												
Katie Clear .....												
Nellie Livingston .....												
Ora West .....												
Pearl Spoor .....												
Amelia Hoffman .....												
Loretta Walsh .....												
C. Emmett .....												
M. Saul .....												
Mamie Pohl .....												
A. Hagele .....												
S. Kelly .....												
Berye Hedden .....												
Merle Schreves .....												
Jessie Baker .....												
Hazel Bloom .....												
Flora Daughterty .....												
Pauline Fritz .....												
Mable Kennedy .....												
Miss Pinkton .....												
Frances Dwelly .....												
Mary Jackaway .....												

TABLE SHOWING METHOD OF RATING OPERATORS.

without it, as they realize that unless they keep up to a certain standard, they are not retained in the service.

#### HANDLING CORDS.

The operator is taught that there is only one way to handle cords, and that is by taking the plug between thumb and first two fingers and inserting and disconnecting with the hand in this position, and never allowing any pressure of the hand on the cord near the plug. She is not permitted to drop a cord to the table. This diminishes the wear on the cord and the noise in the operating room.

#### ATTENDANCE.

As all of the operators are made responsible for certain positions they are taught to feel that nothing except sickness should keep them from their work.

#### WHISPERING.

Operators are not allowed to communicate with each other in the operating room as it not only takes their attention from their work but is liable at times to breed dissension.

#### INFORMATION.

The information operator is supplied with a loose-leaf record. This book is kept posted to date with all installations, changes, etc. The information operator's duties consist in looking up numbers, names and addresses that the local operator has no time for. In addition to the loose-leaf record, information has also a numerical card file with the record of the installation of every subscriber.

#### SPEED TESTS.

The operators are frequently given speed tests to ascertain which is the swiftest operator. These tests are more often taken on the evening service, when the positions are not all filled and especially if some operator is absent or taken ill and her place is left vacant. Each operator is given a multiple peg and during the busiest hour of the evening, a speed test is taken. The operator who answers the most calls is excused an hour earlier than usual. It keeps them all on the alert for every call and in this way the absent operator is not missed.

#### CONTENTMENT.

Through the office prevails a feeling of good will and contentment. This is due to the way the operators are treated by the company socially. The operators are taught to realize that the rules must be carried out to the full extent. On the other hand the company often gives a sleigh ride, a theatre party or a picnic to break up the monotony of the every-day routine work. This perhaps has as much to do in the way of bringing about the excellent service that is established in this city.

[Miss Barnes, the author of the foregoing article, is the chief operator of the Interstate Telephone & Telegraph Co. Her home is at Springfield, Ill., whose exchange is her own special hobby. She is so proficient, however, in the training and management of operators that the company has placed her in general charge of this work in all its exchanges.]

A merger of the Home Telephone Company, of Fort Wayne, Ind., and the National Telephone & Telegraph Company is being considered.



# Work of Dominion Telephone Committee

F. DAGGER, IN "CANADIAN MUNICIPAL JOURNAL."

(Continued from February Issue.)

I have not referred to British Columbia and Prince Edward Island, for the reason that no evidence has been heard from these provinces. British Columbia formerly had several telephone companies, but with one exception these systems are now all owned by the British Columbia Telephone Company. According to population, this province has more telephones than any other part of the Dominion. This development was effected by the efforts of the individual local companies before their consolidation. It will, therefore, be interesting to note whether the growth will be as rapid in the future. Prince Edward Island is furnished with telephones by the Telephone Company of Prince Edward Island, and with a population of 103,259 had on March 30th last only 530 telephones, or one to 195 inhabitants, a very small development considering that this province has the greatest density of population in the Dominion.

The question of exclusive contracts with railway companies was thoroughly investigated by the committee, and it has transpired that with the exception of the Nova Scotia Telephone Company and the Telephone Company of Prince Edward Island, all the dominating companies in Canada have made contracts of this nature. Complaints have been made by several witnesses of the inconvenience caused by the refusal to give telephone users access to the railway premises. Complaint was also made by the Merchants Telephone Company, of Montreal, and the St. Lawrence Telephone Company, of Sorel, Quebec, of the refusal of the Grand Trunk Railway to permit a line to be run across the Victoria Bridge near Montreal, thereby preventing the building of long distance lines connecting Sorel and other points in Quebec with Montreal. The reason assigned by the Grand Trunk officials for refusing these facilities was the existence of an exclusive contract with the Bell Company. I may add that the Bell Company has agreements of this nature with twenty railway companies. An effort was made to secure information as to the practice in the United States in regard to railway companies, and from replies received, it appears that while the railway companies formerly excluded Independent telephones from their premises, they are now in the majority of cases compelled to take them, and pay for the service just as other subscribers do.

Touching the question of control of the streets, it is within your knowledge that the committee has heard a deputation of the municipalities upon this matter, and next year's committee will no doubt consider this phase of the telephone situation before a final report is submitted to Parliament. In the meantime, there is no new information to convey on the subject. My own opinion on this subject is, that all telephone companies should have the same rights and privileges, and that it is not just to permit one company to enjoy these rights to the exclusion of all others. Further than this, I do not consider that the vested rights of a company representing \$10,000,000 of capital and bonds, one-third at least of which is held in the United States, should be allowed to weigh in the balance against the vested rights of all the municipalities of this great Dominion. Moreover, this property of the ratepayers is being used primarily for the purpose

or private gain, and therefore the municipalities should have a voice in the matter, and should be entitled to make their own terms with the companies making such use thereof.

One hundred and thirty-five letters have been received from municipalities in response to inquiries sent out by the committee, and out of this number fifty contain expressions in favor of government ownership and control of the telephone systems of the Dominion, particularly of the long distance lines. These replies have come from all parts of the Dominion, from the Maritime Provinces to British Columbia, and I may add that the inquiries issued by the committee made no reference to the question of public ownership, therefore the opinions expressed in the replies received were entirely spontaneous. The committee was also indebted to the Union of Canadian Municipalities for much valuable information collected from the municipalities and forwarded to Ottawa. A summary of this information is printed in the proceedings.

Two important witnesses heard on behalf of the Bell Telephone Company were Mr. Herbert Laws Webb, late chief engineer to the New York (Bell) Telephone Company, and Mr. F. A. Pickernell, assistant to the president of the American Telephone & Telegraph Company, the successors to the American Bell Telephone Company. Mr. Webb's evidence was intended to show that public ownership of telephone systems in any form was a failure, and especially so in the case of municipal systems. On the other hand, however, the committee has received documentary evidence from the municipalities of Glasgow, Brighton and Hull, England; Rotterdam, Holland; and from Jersey, Channel Islands, showing that while these systems are giving a satisfactory service at lower rates, they have a surplus after paying all expenses, including interest and sinking fund. These reports are all printed in the proceedings, and will make an interesting study to all who read them.

The evidence of the other Bell expert witness was mainly directed towards showing that there were great physical difficulties in arranging for the interchange of service between the Bell Companies and the Independent and rural lines. In reply to this, two important witnesses representing the United States Independent companies, Mr. A. L. Tetu, secretary of the National Interstate Telephone Association, and Mr. J. B. Ware, secretary of the Michigan Independent Telephone Association, gave evidence showing that the large local Independent companies and the long distance companies were interchanging service with small rural systems in all parts of the United States, and that the Bell companies were being forced to do likewise, though in consequence of the conditions of the latter, the smaller systems preferred to connect with the larger Independent companies.

I may also mention the fact that the committee has received a copy of an act recently passed by the Legislature of Wisconsin, prohibiting discrimination in rates by telephone companies operating in cities, towns and villages of equal population, and this may be worth the consideration of Canadian municipalities. At the present time, telephone rates in Canada are based, not on the population, but on the number of subscribers, hence it is

possible for two towns of equal population to have telephone service at unequal rates.

Having endeavored to place before you a brief summary of the more important points of the work of the telephone committee, I will, with your permission, conclude with a few remarks of my own upon the telephone situation.

I believe that the final solution, and the only satisfactory one, of the telephone situation, will be found in the government ownership and control of the long distance lines, and municipal ownership or control of the local exchanges, with an unrestricted interchange of service between all systems, conditional upon the proper standardization of all equipment. I am quite ready to concede that it may require some considerable period of education, and possibly much aggressive competition, before this final result will be attained. I fail to see why the same principles as apply to gas, water or electric light service cannot be made equally applicable in the case of the telephone.

I believe, further, that a satisfactory local telephone service cannot possibly be furnished by any company controlling a large territory, nor, in fact, by any government operating over such a vast dominion as Canada, for the reason that either of these systems must of necessity have a centralized point of management from which the cast-iron policy governing the system in every locality, irrespective of local conditions, is promulgated. A local telephone exchange, to be a success, must be controlled locally by citizens in whom the people repose confidence, and from whom they can obtain a speedy removal of all reasonable causes for complaint. It may be a matter of sentiment, but it is true, nevertheless, that the relations between the public and a corporation foreign to the locality in which it is operating, can never be of such an amicable a nature as those between a citizen and his fellows. To this fact is due the enormous development of Independent

telephones in the United States during the past ten years, which has resulted in that period in the building up of a service consisting of 2,500,000 telephones, as compared with a growth of less than 600,000 in the twenty years during which the Bell Telephone Company held undisputed possession of the field. Not only on this continent, but in Europe, experience has taught the same lesson. Note the rapid development in the telephone business in those English cities which have adopted municipal telephones, also the unparalleled success of the local telephone company in Stockholm, Sweden, in competition with the government system, where the local company has 38,000 telephones, 32,000 of which are inside the city limits, the population being 318,398, and this notwithstanding the fact that the company subscribers have at present no long distance service.

I cannot predict what the final result of the government's investigation of the telephone conditions will be, but I have no hesitation in saying that I believe the people can safely leave the matter in the hands of Sir William Mulock and the committee, to whom will be entrusted the preparation of a report, to make such recommendations to the government as will very materially assist the development of the service in all parts of the Dominion, and particularly in those districts which have hitherto been neglected.

[The foregoing address was delivered by Mr. F. Dagger, telephone expert to the committee for the investigation of telephones, before the Fifth Annual Convention of the Union of Canadian Municipalities, and reported in a recent issue of the *Canadian Municipal Journal*. At the conclusion of the address the convention expressed, through a resolution, its satisfaction with the results of the telephone inquiry, and expressed a view favorable to the ownership and operation of long distance telephone lines by the Canadian government, "under conditions which will enable every telephone user to have unrestricted inter-communication between all local systems now in operation, or which may be hereafter established."]

## Telephone Revenues

W. P. HEMPHILL, TOPEKA, KAN.

The evolution of the telephone has been so rapid that few have been able to keep pace with it. If you should ask an experienced telephone man the most important feature of the business he would tell you that it was the subject of rates, and if you should ask him what phase of the business contributed most to its success he would certainly tell you that it was the efficiency of the service. The questions of rates and service when considering the success of the enterprise are mutual.

The question of rates is one which demands serious consideration. It is a subject, perhaps, which few have ever stopped to consider, and analyze from a scientific, mathematical standpoint and yet, all realize it is the very source of existence.

Generally speaking "Telephone Revenues" can be derived from only two sources, namely "Rentals" either flat or measured service and long distance tolls. A uniform rate to be charged by the various companies is out of the question, owing to the different conditions surrounding each station. Rates must be based on local surroundings. The reason why service can not be furnished uniformly to large and small cities are many. The population of the district to be supplied with serv-

ice must be considered, also the manner of construction necessary, and the ultimate capacity of the plant, and many other questions which enter into the cost and operation of an exchange, and upon which a reasonable interest on the capital invested must be met.

The question of determining what an equitable rate should be considered from the point of a given investment is a proposition too indefinite to consider, but as the rates of every company represented by this association have already been determined a discussion of this phase of my subject is entirely unnecessary.

What interests us chiefly now is methods of getting that which we are entitled to receive under the franchise and ways of increasing the gross earning without a corresponding increase in the operating account. In the first place, the selection of the subscriber is of great importance. It is upon him that you must rely for the major part of your income. His paying qualities should be well considered, the permanency of his location should be ascertained, the probable cost of getting a line to him and likewise the future maintenance of same.

He should first be taught to understand that the punctual payment of his account is an important obligation

and that it is very much preferred that he pay it by sending check, or by coming to the office in person. Considerable saving can be made even by a small company by insisting on the policy of subscribers paying their dues at the office. This custom allows a closer friendship to exist between the management and the subscriber and saves the expenses of collection. At Topeka we have adopted very stringent rules regarding payments and expect to continue to insist on their being observed. When subscribers become delinquent they should be notified at once, either by a statement or preferably by the book-keeper calling them over the telephone. If they are able to give reasons for their inability to meet their account it should be carefully noted, otherwise an urgent demand should be made for a prompt settlement. We accept the theory that a company can lose nothing from the enforcement of a very rigid policy covering the collection of accounts.

There is a growing tendency in the minds of a great many people to shirk them, on the theory that any franchise-holding company is reaping an abundance from the profits of its business. The chief duty of the telephone company is to furnish the best possible service, the subscribers' duty to the telephone company is to pay their bills promptly and treat its employees, especially the operators, with consideration. Any telephone company makes its reputation largely as a result of the enforcement of these principles. The subscriber is a partner in your business. It is with him that you have to deal. Thus it will be seen how important a matter the choosing of him should be.

Rentals should be paid in advance and any part unearned refunded if for sufficient reasons the patron can not keep the service for the period paid. No installation should be accepted short of one year, for as a general rule, it can not be handled with profit for a shorter period. The public generally has confused the idea of cheapness with the cost of telephone service. To it, an instrument connected with some wire, attached to the nearest telephone pole constitutes the greatest cost of furnishing service.

It has no conception of how these calls get to the central office, the method of giving connections, or the intricate and costly mechanism necessary to handle its business and the labor necessary to keep it in operation; it sees only the instrument on the wall and the wire connecting it to the pole line. It is a frequent occurrence for some prospective subscriber to tell you that his order was given some days ago and that you must be derelict in your business, and when you attempt to explain the reason why the instrument has not been installed he generally paralyzes you with the absurd statement, "That the company has poles and wires in his alley and the only thing left to be done is the placing of the instrument." The general public little understands what a telephone exchange is, and the tremendous cost of equipping and maintaining it, and this is a great reason why a subscriber should understand in the beginning that punctual payment is the essence of his contract. Non-payment without a reasonable excuse should mean a prompt forfeiture of the service.

As to the revenues derived from toll-line service: The local exchange and the local toll-line company mutually linked together. The exchange must have the toll-lines to provide its subscribers with long-distance connections; it is equally essential for the toll-line company to have the

exchange to supply its business. In the division of revenue between them, the idea of this common interest should prevail. In my mind there is no question but the equitable basis for arriving at a just division, should be estimated on the amount of business originated by the exchange rather than on the basis of incoming and outgoing messages, for the reason that the greatest expense to the exchange in handling toll-messages comes from the necessity of making collections and accounting. Toll-lines will never be any considerable source of profit to the average exchange company, while essential in every respect the exchange must depend indirectly upon the prestige the toll-lines afford as its source of profit.

Few Independent companies in the beginning were aware that to maintain a system it would cost more per telephone, to operate, say, one thousand lines than five hundred lines, but they have since discovered when figuring operating expenses and after setting aside a safe amount to cover depreciation, that there is nothing left.

Let us consider briefly, some ways of increasing revenues without a corresponding increase in the investment and operating accounts. Telephone service should be graded to suit the peculiar needs of the people. We can find relief in the use of party lines which place the rates within the easy reach of a greater number of people. The rapidly increasing use of the telephone has made a demand for its service upon every class of business. The exchange should be in a position to supply all with telephone service without working a financial burden to any.

As an illustration of how this may be done I want to cite the situation at Topeka. Our single business line rate is \$36 per year, while that of the single residence line is \$30. We also furnish a rate of \$2.50 per month by allowing two business houses whose location is in close proximity to be put on the same line, thus paying us \$60 per year for practically the same investment as the single line for which we charge \$36.

In the residence district we put four subscribers in the same block on one line and charge each subscriber an annual rental of \$18, thus getting a gross income of \$72 per line per annum. Our party lines are made up in blocks so that the line and pole construction is no greater than that of the individual lines and from which with the additional investment of three instruments and the labor of installing them we receive an additional revenue per line of \$3.50 per month or \$42 per annum.

For five hundred individual residence lines we would receive an annual income of \$15,000, while for the same number of four-party lines we would receive \$36,000 per annum or a difference in gross income of \$21,000 in favor of the party lines. The additional investment for installation does not exceed \$2,000, so that this difference in income (which is \$21,000) would need to pay a reasonable interest on the \$15,000 additional investment, which at best could not be over ten per cent or \$1,500. This still leaves a balance of \$19,500 to the good of the party line service.

But the additional 1,500 telephones which have not added a dollar to the investment in switchboard, toll line, and cable equipment has added additional burden on the operation forces over what the number of individual lines would be.

Yet on our basis we still have a possible balance of \$19,500 on a given number of 500 lines, to liquidate all charges from the operating maintenance and accounting departments. We feel that our party line service fills every requirement of the average residence. Many of

our most influential people who are amply able to pay for any class of service desired, prefer to remain on a party line rather than pay the additional rate of \$1.00 per month. In this class I can include a large majority of the bankers of our city, every minister (with one exception), many of Topeka's noted lawyers and scores of our business men, among whom I mention the secretary and treasurer of the entire Santa Fe system.

We have, I think, demonstrated with satisfaction, that party lines under the enforcement of rigid rules as to time limit for conversation and general courteous treatment among the subscribers, can be made a cheap and practical means of supplying service, and the principal source of profit to the investor.

Party lines are not the only means of increasing the revenues per line without a corresponding increase in the investment. An extension telephone at a rate of from 50 to 75 cents per month is an excellent and profitable investment to any exchange.

The solicitor should be instructed to work this line of business, the value of which can readily be shown to the business man in saving time and many unnecessary steps. It allows him to answer calls promptly and many times permits him to dispose of business matters in less time than it would take him to reach the main telephone. Certainly no part of the business can show better profits than the rental of extension 'phones at the customary rates. They can be made to overcome losses from unprofitable rates elsewhere.

Private branch exchanges for the large business institutions and pay stations for the use of the general public in the larger cities are also "revenue providers." I believe many of the smaller exchanges would find that public pay stations at convenient places for local and long distance service would add materially to their collections.

I want to say here a few words about "Deadheads." Every exchange has this disagreeable business to a greater or less extent and the tendency is ever to increase and never to diminish. The policy of donating service to favored classes and in lieu of special favors is a bad one and should be discouraged. There are few advantages to be gained and many disadvantages to overcome. Telephone service should be treated as any commodity. It should be purchased and paid for at its true value. There is no more reason why a telephone company should purchase its prestige through the means of "deadhead-

ing" than there is for a dry goods merchant or grocerman to give his goods away in order to court public favor. Success rests upon good service; it is the only means whereby substantial and lasting business can be built up; without it no amount of "deadheading" can secure it and without it none is necessary.

The subject of "deadheads" calls to mind the frequent custom of "free service" between local exchanges. This policy injures the whole line in business and discourages investment along this line. Expediency may seem to justify this interchange of business in order to strengthen the exchange but the sound wisdom of such a course is never the less questionable. The good effects resulting from these combinations are only temporary and are soon lost sight of. The connecting lines are always overtaxed with useless calls so that legitimate business must be sidetracked. This condition is unsatisfactory to the greatest interests which are the main support of all exchanges.

A reasonable charge can be easily maintained between local points, and should be for the good of the service as well as the financial benefits accruing.

But what of the future of the telephone business? What great changes will the inventive genius of man accomplish? What will the telephone exchange of ten years hence be like? How will it be constructed and operated? Certainly we are drifting rapidly, but future development will work even greater wonders than we have seen in the past.

Let me make a prediction. This idea of equipment will predominate. The manual board will be superseded by the automatic, the automatic telephone will then be provided with selective ringing and lock-out devices, for party line services, thus doing away with the present disagreeable feature of this class of service and insuring a basis of rates within the reach of the greatest number of people. The heavily loaded pole line leads of to-day will have been displaced with a perfect cable system, multiple taps in every block. Nothing but insulated wire will be used. The continual struggle of keeping up the collections and the disagreeable features incident to the same, will be overcome by the adoption of measured service rates. Unlimited service is unscientific from the standpoint of investment, and unjust to the subscribers, as it compels them to pay for the service of others.

[The foregoing address was given before the Annual Convention of the Kansas Independent Telephone Association, at Wichita, Kans., Jan. 22, 1906.]

## Godard on Kansas Conditions

Gentlemen of the Kansas Independent Telephone Association: I am glad to meet you at the fifth annual convention of our association and to report to you that its affairs are in prosperous shape and that the Independent Telephone companies of this state are growing in size and increasing their ability to meet demands upon them for service. Notwithstanding the fact that within the past year a few companies in the state have seen fit to dispose of their holdings to the opposition and some have entered into sublicensee toll contracts with the Bell company, nevertheless the number who have thus left us is so small when we view the state as a whole that their

loss is scarcely felt in the growth and development of Independent Telephone interests.

I hope this meeting may be a successful and enthusiastic one. The Independent Telephone companies of the United States have formed a National association and the states generally are organizing active and live State associations. The Kansas organization has been known as one of the best, but we have got to come to the front and ginger up a little more or we will not hold our position. In fact, I am afraid we are not up to some of the other States now. In Missouri, Illinois, Indiana, and Ohio State organizations are very active and forceful according to reports I have seen, and the battle



between the local companies and the great corporation that formerly controlled and dominated the telephone business is being waged with such vigor that victory is universally on the side of the people. The opposition may here and there make a little headway and some temporary gains, but the pendulum will swing back and other companies again forge to the front.

After the last meeting your president had a somewhat strenuous time with the legislature and we succeeded in having killed a lot of bills which, if they had become laws, would have proved very detrimental to the telephone interests of this State. I am glad to say that in the main the telephone interests and business did not have as hard a time as some other corporate interests. Some of the bills introduced were suspiciously like what are known as grafters bills, but in the main the members of the legislature were friendly toward telephone interests and willing to listen to all reasonable argument in their favor. We have no session of the legislature this winter, but next winter the same ground will have to be fought over again. I am of the opinion that with a reasonable amount of attention any serious trouble may be averted.

The question of taxation again came up before the State board and no radical changes were made in the assessment. The matter will probably have to have some attention again in the spring of 1906.

It is my duty to deliver at the opening of this meeting what is known as the president's annual address. I have chosen as my subject for the few remarks I will make "What have we got? and what will we do with it?" Dividing my text as the old darkey in the story did his I take up first "What have we got?" and answering the question myself, say we have got one of the best business propositions in the country. The telephone business is new, younger than any of us. The instrument was first a toy, and then a convenience, and now it is a necessity. It is closer to the hearts of the people than any of the other great modern inventions. The steam engine, the railroads, the telegraphs, do not come so close to the every day lives of the public as does the telephone. You have noticed how rarely a person ever dispenses with the use of one after being once accustomed to it. The business man never quits. The family that has a telephone if they meet hard times will cut out the summer vacation, reduce wearing apparel and living expenses generally before they quit their telephone service. It appeals more and more to all classes of society. At first the telephone was only used by the rich. Now it is used by everybody. The service is growing better, the rates are reasonable, perhaps too low, and the cry as of every telephone company in the land is that the growth of their property is overwhelming.

In experience we find that people usually pay for a thing all that it is reasonably and fairly worth, and they do this without complaining. It will be found the same with the telephone service. That people will be willing to pay a fair price for what they receive if they are only given to understand that the consideration is a reasonable one. It is best in dealing with the public to be frank and honest. When the people understand what depreciation means in telephone business and have a general knowledge of the cost of operating and maintaining a telephone exchange they will not in my judgment complain of the rates charged by the Independent companies anywhere in the State, and in cases where rates

are too low to be remunerative a fair amount of education should make it possible to raise the rates. This has been done in a good many instances without the loss of a single subscriber. It is necessary in such cases to be very frank with the public and explain fully that the business can not be carried on and good service maintained at the going rates. If the reasons are fully understood and they appear right, I do not think the average exchange manager need fear the results in attempting to make a raise in rates from prices that are inadequate up to prices which are reasonable and fair.

I believe that the telephone business is generally more profitable than the average business occupation throughout the State, but in order to get the best out of any business it must have careful, thorough and alert management. The telephone manager should study his business as hard as he can, giving thoughtful attention to all its details and its every relation with the public if he would get the best results therefrom. There are weak points in the conducting of every business. If you eliminate them from your business it will be a success no matter what the business is, and I know of no better field for the investment of money and effort than the telephone business.

When you have got your telephone plant, what will you do with it? It is constructed for the ostensible purpose of serving patrons. You and your associates have invested money in the proposition for what it will earn. You then use the plant to furnish service to the subscribers and earn dividends for the stockholders. In order to furnish good service you must have a good plant properly handled. It is necessary that the instruments be in first class working order and that they be kept so at all times. It is also necessary that the operators be prompt, courteous and accurate. In order to keep the plant in proper condition it is of the greatest importance that the primary construction should be of the best. That all repairs and replacements be made in such manner that they will not weaken the service and that the work need not be done again for as long a time as possible. It is frequently difficult to get good operators, and more difficult to keep those you do get, continuously active and alert in the performance of their duty. The subscriber who has never seen the inside of a telephone exchange has small idea of the difficulties attending good service. Here again it is valuable to take the public into your confidence, invite them to the exchange to see a busy switchboard and the trouble which the operators have. The better they are acquainted with the business the more charity they will have for the operators and the better feeling they should have for the management. The manager who is keen to keep his service up to the best possible state and to keep the public friendly toward the company is performing an invaluable service for the stockholder, while the manager who is grouchy with the public and who can not manage the operators and keep them courteous to the patrons should be fired at once.

So much for the question of service. We now come to the question of profits, and at the outset let me say that the account which is the greatest hindrance to the distribution of profits in the telephone business is the maintenance account if properly kept. If the construction in the first place is heavy, leaving a large margin above safety, it is economy. If the repairs are equally heavy and substantial, that is also economy. I am aware, and some of you are painfully so, that there has been a good deal of poor construction in this State, but the

plants can be gradually built up, strengthened and improved until they are made right and the mistakes corrected. The maintenance account does not show its ugly head very early in the beginning of the business, but it usually is abundantly in evidence later on.

I think it is generally customary for telephone companies to put all their net profits into construction. This is frequently a mistake. Capital invested in the business should receive its dividends as the business progresses. Your stockholders will be better pleased by the payment of one dollar in dividends than they will if you tell them that the plant has increased in value two dollars. But you say, "Where is the money to come from?" You say if there were no construction we could pay good dividends, but so many people are ordering telephones and the business is growing so it takes every dollar we can scrape together. A plant that is trying to carry its construction out of net earnings is very apt to get in debt and have its business handicapped thereby. There is plenty of money in every community to own and build all the telephone lines that are needed in that community, but before money will be invested in such propositions people must be convinced that the investment is a good one. If you have a few stockholders in your company to whom you have paid dividends regularly for a few years, they will, if your business looks right, want some more stock for themselves or their friends and they will tell people that your stock is good. Suppose you own seventy-five per cent. of the stock yourself, and twenty-five per cent. of it is outstanding among your people. You want your profits to be kept in the company. If you have a margin of unsold stock and declare a dividend by which you receive a considerable sum of money, and the other stockholders smaller sums, you can reinvest your dividend in additional stock of the company and it will be much easier for you to sell more stock outside, or to dispose of your stock if you so desire, if it is known that the same has been receiving dividends and so long as the maintenance and depreciation are provided for out of the earnings of the company and the moneys received from the sales of the stock go into additions to the plant the increase of capitalization is not only legitimate and proper but it puts the plant and the business in a better financial shape for handling. The frenzied financiers of this country have acted on the theory that if a million dollar corporation has two million dollars of stock outstanding it is possible to realize a better price for the sale of two million dollars of stock than it would be for the sale of one million dollars of stock although the actual assets back of the corporation were the same. Telephone people and companies should understand that if a company has a plant worth fifty thousand dollars and earning a good rate of interest that it will be difficult to sell it for fifty thousand dollars if you have only twenty-five thousand dollars of stock outstanding. Now don't understand me as favoring overcapitalization, but I do mean to say that a corporation should in the interests of its stockholders have out as much capital as will equal the net value of its properties, and it will be found that it will be easier to sell the property if it is to be sold outright or in parcels. It will be easier in the case of a merger of telephone interests, which is something you may expect in this State, and it will be easier to borrow and obtain credit if the corporation is capitalized at the proper amount.

Many companies are handicapped seriously by being in debt. It places them in the power of manufacturing

concerns and in many ways interferes with the proper conduct of their business. But you say "How can we avoid this indebtedness?" If we go to the bank to borrow money the rates of interest are high and the loans will be for a short time only. When they may have to be paid we have not more stock for sale or we can not or do not care to sell any more stock, and I apprehend there are many instances when the growth of the business and the growth of the indebtedness become almost appalling. The legitimate and proper form of carrying such indebtedness by a telephone company is in the shape of bonds. But you say where can we find a market for the bonds and you write some eastern bond broker and he tells you that he can not handle them. Your market for the bonds is at home. If the bonds are issued and are not sold they draw no interest. When they have been issued they can be used as collateral upon which to borrow money. You can probably induce some of your friends and acquaintances to take a few of them. After six months rolls around and the interest is paid promptly on the bonds that have been sold, the holder gets to feeling good and the first thing you know people begin to inquire about the bonds, and you will be surprised at the source from which these inquiries will come, and at the readiness with which the bonds will sell, but they probably will not go off at once. Frequently supply houses will take a few of the bonds if the trust deeds securing them have been properly drawn and executed and everything has been done in a legal manner.

In conclusion, don't get discouraged. You have got a good business proposition or you can make it such. Be alive to all your interests; take some of the telephone journals and read them; be exceedingly careful in the purchase of your instruments and apparatus and see that you get only the best; belong to the State association and keep in touch with its officers, and whatever you do don't monkey with the Bell company. If you sell them a majority of your stock you might as well give them the rest for in all probability you will never get any more out of it. If you make sub-license contracts with them you will live to regret it. You have been able to live thus long without them and their connections and you can keep on doing so. Don't believe what some irresponsible agent tells you about some other company and whatever you do don't give them an option on your own property or plant. If they want to buy you out and you are willing to sell to them at your price they are just as ready to close the deal today as they ever will be. They don't get your option for the sake of taking the property under it. They want to use it as a club to beat out your brains, and to bring somebody else in line with them. The option business is one of the smoothest tricks of the opposition company.

[The foregoing address was delivered by former Attorney-General A. A. Godard, retiring president of the Kansas Independent Telephone Association, at the last annual meeting of that body at Wichita, Jan. 22 and 23, 1906.]

C. F. Clark, treasurer and heaviest stockholder in the Montgomery County Telephone Company, at Red Oak, Ia., died the latter part of January. Mr. Clark was probably the most prominent citizen of Red Oak, and had been identified with the company since its organization. By his death the company and the community with which he was so long and so honorably identified, have suffered an irreparable loss. His successor as treasurer has not yet been elected.

# Talks and Queries

## Cells for Automobile Work.

Editor SOUND WAVES:—Are Columbia No. 6 dry cells that test twenty amperes on a short circuit through the ammeter better for automobile work than those which test only ten or twelve amperes?

It is better to use only one condenser on a pole changer, or two with the main battery between, that is one side of each condenser connected to the battery and the other sides of the condensers connected to the line? Answer in the query department and oblige.—A Sub.

On the merits of the case we would be inclined to say that the battery with the highest current density would be best for automobiles provided all else is equal. It must be remembered that the dry battery should not be judged by the current on a short circuit, but on the length of life with the desired current flowing. The chances are that the spark coil will not take to exceed half an ampere. If the battery lasts long enough, why should it be necessary to have it give twenty amperes? The great difficulty with any dry battery is the increase of the internal resistance as it grows old. This increase in resistance may be caused by polarizing, in which case it will recuperate, or the increase may be due to the drying out of the chemical in it. If the voltage runs down quickly on the ordinary load, the battery is not fitted for its work, and the battery is apt to be poor unless the load was too great for that which the cell was designed. If, after a few weeks of use or disuse the battery loses strength, the trouble is caused by the drying of the liquid or by internal action.

We should say, therefore, that the only way to tell whether the battery is doing well is to try two or more cells of each kind under the same conditions and see which lasts the longer.

Not knowing the circuit of your pole changer, it will not be possible for us to tell whether the arrangement of the condensers will be best as you suggest. If your idea is to supply all the battery to the line through the condensers, it will not do. The condenser will pass alternating current only; to direct current it acts as an insulator. The condenser and the retardation coils of a pole changer are used to smooth out the sharp corners of the alternating current as it comes from the pole changing switch, so that there will not be induction between the lines from the ringing currents. The condenser is also used to prevent the spark at the contacts of the vibrator.

## Trouble on the Line.

Editor SOUND WAVES:—I have a piece of trouble and would like to see if you can give us any light on the subject. We have a metallic toll line twenty miles long and it talks fine when it does talk, but it "goes dead." The central office at the far end rings back and it comes to life, but it will not do so when we ring. There are no stations along the line. It runs the twenty miles without a break.

We have sent out our lineman over our half repeatedly and I have gone twice myself. I would vouch for our half being clear. Martin has done some work with their end but I cannot vouch for the care that was taken.

What gets me is that when Martin rings, the dead line is cleared, but when we ring there is no effect. Would rusty joints cause this? If so why does it become so clear and then dead? It is the same in wet as in dry weather. If you can enlighten us we would be thankful.—J. V.

A bad joint or contact in the circuit, somewhere you may depend upon it. These troubles which come and go are sometimes almost enough to drive one to drink. If you do not have any measuring instruments, the best way to do is to run down the trouble some time when the line is out.

Some day when the line is acting up, disconnect it from the switchboard at the office terminal and then test outward and inward. If the operator in your office can talk to you all right you will know that your office is in good shape. On the other hand, if the office cannot be heard and the office at Martin can be called and talked to, it is obvious that the trouble is in your own office.

Hunting trouble is a process of elimination, in other words you find where it is not and there are a comparatively few places where it can be.

After determining that the trouble is not in your office make a similar test at the outer end of your cable, if you have one. You should have a lineman's test telephone for making tests on the line and should not go on mere inspection from the ground.

If, after making the tests, you are positive that the trouble is not at your end, instruct the man at the other end to do the same. It is a good idea to have the operator at the other end leave the line dead while the tests are being made, for if the line will stay out, it is an easy matter to locate the trouble.

A rusty joint can cause the trouble, but a ring from either end is apt to overcome the difficulty. If the trouble is nearest to the other end the operator is more apt to ring through than your operator.

The chances are that the trouble is in the switchboard at the other end. Most likely there is key contact trouble. When the operator rings, the circuit in the cord is opened at the key, and then when the contacts are again made in the circuit they may be poor. The ringing again readjusts the contacts and then everything is all right. There may be jack trouble in the same way. There may be too light a pressure of the jack springs or the sleeve of the plug or jack may be dirty and the ringing current arcs cross, causing a weld where the arc occurs. If the jacks and keys are all right, test the cords, for they may be worn out. That is a favorite place for trouble germs.

If you find that the trouble is out on the line, the only way is to go out over it and test till you have located the difficulty. Some day when the line goes out, disconnect it at both exchanges so that there is a good chance to have it stay out, then connect a telephone at one end and have someone listen in all the time so that you can talk without having to ring. Start out over the line and make a talking test every mile till you get to the place where the cut off occurs. You will then have the bad joint located. It might be well to disconnect only from the far end and then have one of your operators connect a plug

to the cord leaving her listening key open. As soon as there is any talk on the line she can note it at once.

### That Roaring Noise Again.

Editor SOUND WAVES:—We have a grounded telephone system running through a small town where they have electric lights. When the lights are on we cannot use our line because of the noise. We have examined the same and have found that their insulated wires cross below ours. If we should put heavy insulated wire up instead of the galvanized iron that we now have, would it stop the noise.—O. T. H.

The trouble is that you have a grounded line. You could put three feet thickness of insulation on your wires and it will do no good. It may be that the lighting circuit has a ground on it. If that is the case there will be a great deal of trouble. Such a case would cause your lines to be almost unusable. The crossing of their circuit under yours at right angles would probably not cause any disturbance. If their wires run parallel to yours and on the same side of the street there would be great disturbance by induction.

If the system is an incandescent circuit we are inclined to think that the trouble is that it is grounded, and in such case you had better get after them.

### Coils and Voltages.

Editor SOUND WAVES:—I. With five 110 volt incandescent lamps in series with 550 volts direct current, what would be the voltage after passing the resistance?

2. Would the voltage be the same after passing equal resistance in the line circuit?

3. Would the voltage be the same, if the current was alternating?

4. What is the theory of the Pupin coil, used on long distance lines.—K. L.

1. If the voltage of the source of the energy is but 550 and if the lamps are the only resistance in the line, then there will be 550 volts between the first and the last lamp, and the lamps will be the only source of a drop in the voltage on the line. It will be found that there will then be 110 volts across each lamp. As a matter of fact all conductors possess resistance and there must be a drop in voltage all along the line and in the source of the energy itself. Therefore if you want five hundred fifty volts at your lamps, the generator voltage must be higher, to take care of the drop in the line.

2. If you had a resistance equal to that of the lamps in series with the lamps, and if the generator voltage was 550, there would then be but 225 volts across the lamps and 225 across the resistance. The voltages around each of the resistances on the line will add up to the voltage of the generator. The line includes that portion of the circuit inside of the generator as well as that outside.

3. Yes.

4. The theory of the Pupin coil would be too long and too much involved to give in these columns.

The Pupin coil is nothing more nor less than an impedance coil which is placed in series with the line at frequent intervals. The reason that the voice cannot be carried over very long distances, is not so much because of the resistance, but because of the capacity which is

distributed with more or less uniformity over the whole length of the line. When a current passes into a conductor of this kind it will have to charge the line before it will be carried to the other end. This takes a perceptible time on long lines and in the case of rapidly alternating voice current, the reversal occurs before the line is fully charged. The result is that the voice wave is very much attenuated, or distorted. If there were impedance only on the line there would be a similar trouble, but when the impedance and capacity of the line are proportioned correctly, the effect of the one will neutralize that of the other and thus conversation may be carried over much longer distances than when either is present alone. This is a case of making a bad thing do good. The self-induction or impedance would be best if distributed uniformly throughout the whole length of the line; but that is not at present practicable. These coils must be of exactly the right dimensions or they will do more harm than good.

### Ground at Both Ends.

Editor, SOUND WAVES:—Here is something that I wish to ask.

1. In Hyde's Telephone Troubles and How to Find Them, it says on page 38 "Be extremely careful when building grounded lines to have good grounds at both ends."

2. "To avoid the necessity of using two wires for each circuit, the line is run to ground at each end, the earth taking the place of a return wire."

Please explain this as I hardly know what it means. We have thirteen grounded lines and none of them are grounded at each end; I never saw one that was.—J. T. P.

We think that if you stop to think a moment you will see that your line is grounded at both ends. You have end telephones and the line runs through these instruments to the ground. If the line has but two telephones on it, it is very apparent, but with a dozen or more the expression is a little obscure, if the instruments are of the bridging type. On a series party line, the line goes through each telephone in succession and the line is grounded only at the end, each telephone having a ground only for the lightning arrestor. Had the author said "Be extremely careful to have good grounds wherever the ground connection is used as part of the circuit," he would have covered all cases, both bridging and series. There are very few series party lines now, but a comparatively short time ago there were very many of them. In exchanges the advice of the author regarding a ground at both ends of the line is good. There is usually but one telephone on a circuit, the line running to a switchboard. This line must be grounded at the telephone and also at the switchboard, or at each end of the line.

The Pana, Ill., Telephone Company has been merged with the Christian County Telephone Company.

The Table Rock, Neb., Telephone Company has finished its rural lines around this town and vicinity.

The Champlain, N. Y., Telephone Company are extending their line to Mooers.

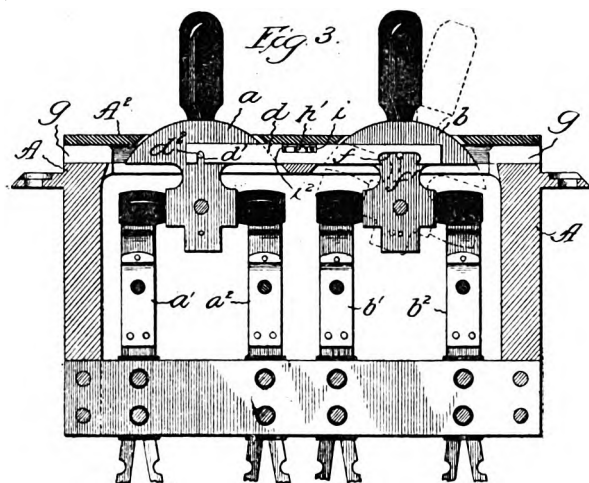


# Recent Telephone Patents

Edward B. Craft, of Chicago, Ill., assignor to Western Electric Company, of Chicago, Ill., a corporation of Illinois. Ringing key. Patent No. 805,057, November 21, 1905.

This invention relates to a switching key for telephone exchanges, and has for its object to provide in a key having two switch levers mounted one before the other an improved, simple and compact arrangement where in the manipulation of either one of the switch controlling levers will restore the other lever to normal position.

It consists of a frame, a pair of rocking levers supported thereby, one before the other, and projecting above



the upper surface of the frame, switch springs mounted upon the frame and associated with said levers, a pair of reciprocating links mounted in longitudinal grooves in the upper portion of the frame on either side of said levers, each link being pivoted at one end to one of said levers and having a longitudinal slot near the opposite end thereof, a pin carried by each lever adapted to ride in the slot of the link connected with the other lever, and a centrally pivoted cam between the levers adapted to ride in slots in said links to operate the same; whereby each key when rocked in a given direction operates said links to restore the other key from one of its actuated positions, and when rocked in the opposite direction operates said links and cam to restore the key from the same actuated position.

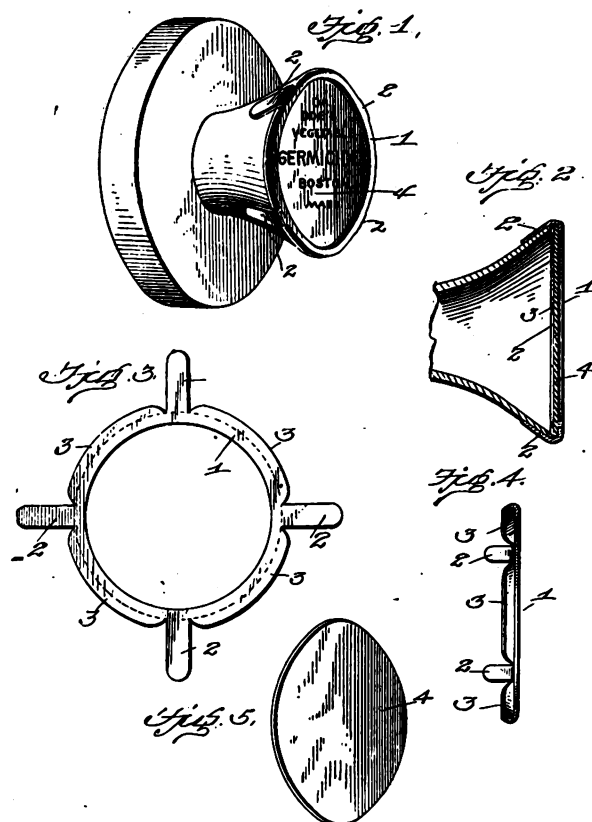
Metta Frances Hubbard Phillips and William Beck Hubbard, of Boston, Mass. Mouthpiece attachment for telephones. Patent No. 806,284, December 5, 1905.

This invention relates to improvements in mouthpiece attachments for telephone transmitters.

The object of the invention is to provide an antiseptic attachment or covering for the mouthpiece of the transmitter of telephones which may be quickly and easily attached to said mouthpiece and which will not in any manner interfere with the operation of the transmitter.

A further object is to provide a device of this character which will be simple and inexpensive in construction, thus permitting the same to be manufactured and given away as advertising mediums and which will be absolutely germ proof, thus preventing any possibility of disease being transmitted by the mouthpiece of telephones.

It comprises a sheet metal ring having peripheral lugs arranged at suitable distances apart thereon, said ring being also provided with a series of inwardly curved peripheral edge flanges, interposed between the lugs and



having opposite curved ends to permit of said lugs having movement between said curved ends, and a paper disk serving to contact with and held to said ring by having the flanges curved around it.

Leonard J. Fletchall, of Hatfield, Mo., assignor of one-half to Mark L. Belden, of Hatfield, Mo. Electric switch or disconnecting device for telephones. Patent No. 804,940, November 21, 1905.

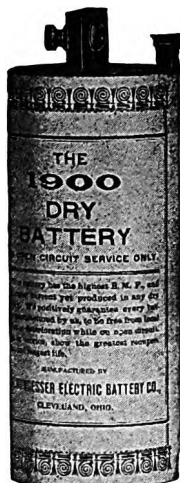
This invention relates to improvements in electric switches or cut-outs for telephones, telegraphs, and other electrical instruments, and has for its object to provide a simple, inexpensive, and efficient device of this character by means of which the telephone or telegraph instrument may be readily disconnected from the main line in case of an electric storm, thereby preventing the instrument from being burned out or otherwise damaged.

A further object of the invention is to provide a switch adapted to be mounted on a suitable frame or support outside the house or other structure in which the electrical instruments are located, said switch being movable to open and closed positions through the medium of an actuating cord or chain, one end of which is connected to the switch blade and the opposite end thereof extended within the building, so that the switch may be operated without the necessity of leaving said building.

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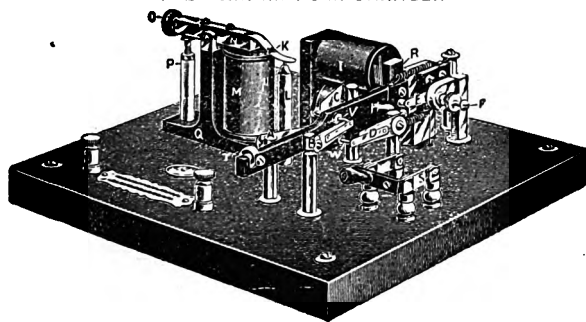
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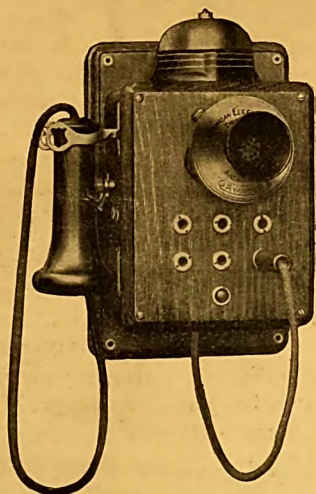
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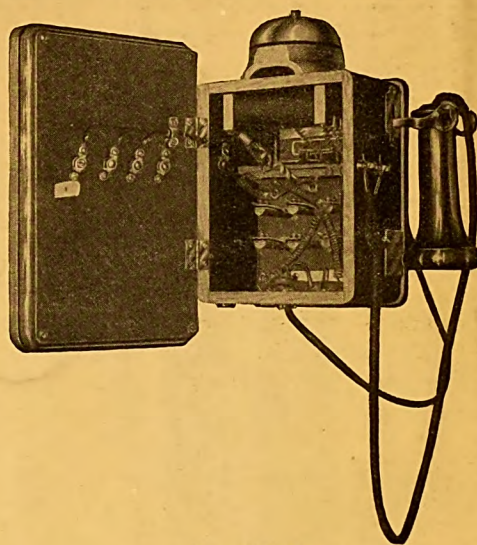


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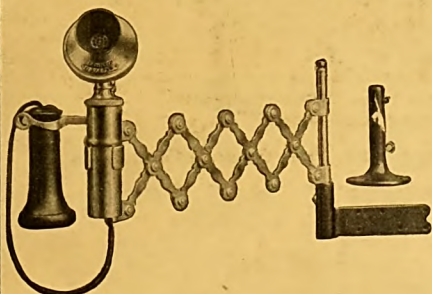
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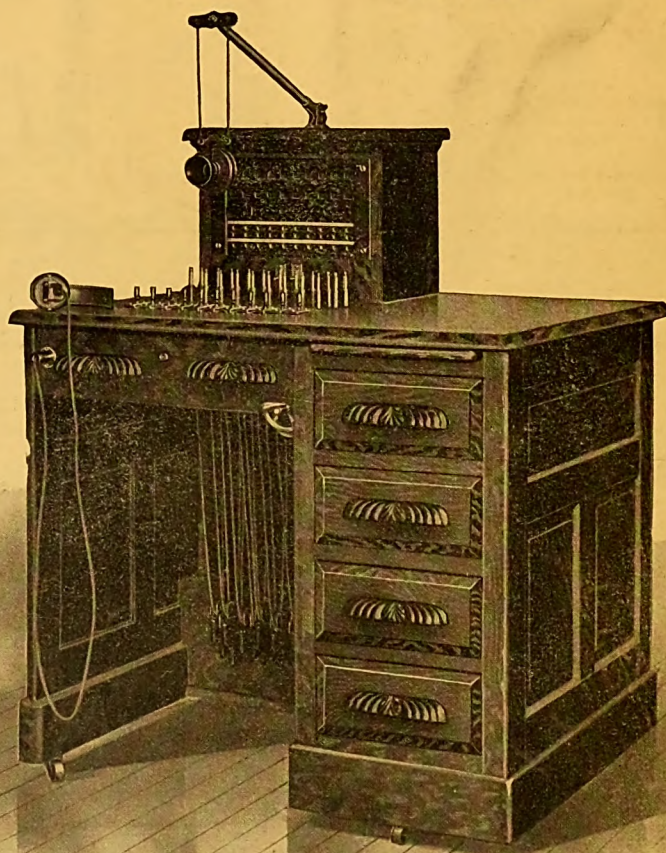
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# SOUND WAVES

VOL. XI.  
No. 5

AN ADVOCATE OF  
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APRIL  
1906

Published Monthly by THE THOMAS H. WILSON CO., Logansport, Indiana

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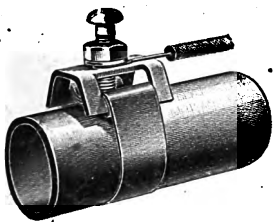


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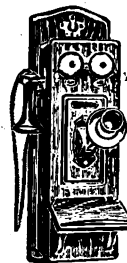
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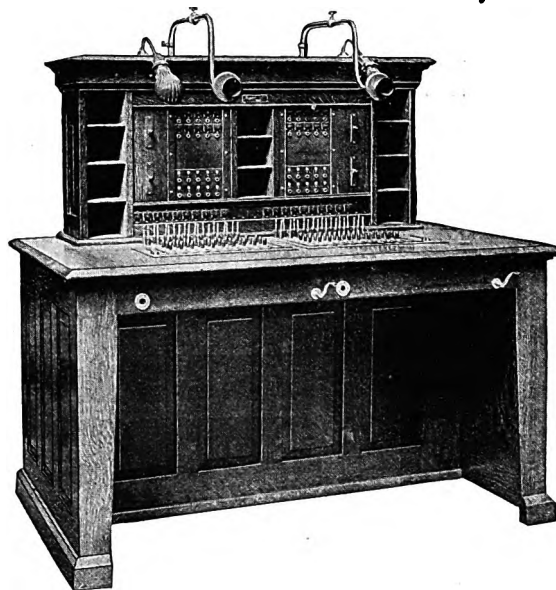


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# SOUND WAVES

A Monthly Magazine Devoted to the Interests of Independent Telephony

Vol. XI.

APRIL, 1906

No. 5

## SOUND WAVES

PUBLISHED MONTHLY AT LOGANSPORT, IND., U. S. A. PRICE FIFTY CENTS A YEAR

Entered as second-class matter July 14, 1903, at the Post Office at Logansport, Indiana, under Act of Congress of March 3, 1879.

The Thos. H. Wilson Co., Logansport, Indiana, Proprietors and Publishers

W. A. TAYLOR, Technical Editor. . . . . 1362 Monadnock Bldg., Chicago  
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Telephone, Logansport Office, Black 441

Telephone, Chicago Office, Harrison 1521, Chicago Telephone Co.

Telephone, Chicago Office, 2904, Illinois Telephone Co. (Automatic)

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One Year, Foreign Countries . . . . . 1.00  
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New Advertisements can be inserted if received by the 5th of each month, but to insure proper classification they should be in this office by the 1st.

Not mail the paper promptly, it is necessary for us to adhere strictly to the above, and we will appreciate the co-operation of advertisers.

Subscriptions, Etc.—Address the Logansport Office. In sending personal checks for books or subscriptions, include 15 cents for exchange.

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## EDITORIAL COMMENT

All communications to the advertising department of this paper should be sent to the Chicago office, addressed plainly to **SOUND WAVES**, 1362 Monadnock Bldg., Chicago, Ill. All communications to editorial department, answers to want advertisements, subscriptions, etc., address **SOUND WAVES**, Logansport, Ind. Subscribers and others will confer a favor and facilitate the work of this paper by complying with the above request. Technical and news contributions will receive prompt attention and are respectfully solicited.

### "GIVING THE DEVIL HIS DUE."

The Chicago (Bell) Telephone Company approaches its day of reckoning. Years of aggression and greed during which this corporation has milked the telephone users of Chicago of millions of dollars, are nearing an end by a decision of the Supreme Court of Illinois, handed down by that court on February 15 last.

This decision is the culmination of a series of legal battles, which began some years ago in a suit instituted by the members of the Illinois Manufacturers' Association in October, 1902, when Attorney Levy Mayer, for the association, filed an application for an injunction against the telephone company in Judge Tuley's court, asking that the company be restrained from charging the petitioners a rate in excess of that stipulated in the franchise ordinance. The court sustained the position of the association, reducing the rate paid by the members of the plaintiff association from \$175 a year for business 'phones to \$125 a year, the franchise price. The telephone company appealed and the appellate court sustained the decision of the lower tribunal.

Later the Alton Grain Company enjoined the telephone company from charging \$175 a year for service and compelled it to reduce its rate to the ordinance price. In July, 1903, the petitioners both filed a supplemental petition demanding the return of the overcharge previous to the suits. This litigation is still in court and will be heard this month.

In addition to the two chancery proceedings mentioned, between 800 and 1,000 subscribers brought suits in justice courts and obtained judgment for the return of overcharges.

The last decision of the Illinois Supreme Court is the direct result of quo warranto proceedings instituted by the state's attorney of Cook County, demanding that the company show cause why it should not be ousted from the streets for its failure to comply with its franchise in the matter of rates. The lower court ruled in favor of the telephone company; the city carried the case to the Supreme Court of the state and secured a decision in favor of the city and against the company; the court, however, did not go to the extent of ordering that the company be ousted from the streets, but ruled that its

rates must be reduced to the franchise provisions, that the company is liable to the city to pay into the city treasury three per cent of its gross proceeds based on the franchise rates from all territory added since the original grant and to return to the subscribers whatever sums it had collected from them not outlawed by the statute of limitations, in excess of the rates allowed by its original franchise.

The city took the position that the ordinance of 1889 granting a franchise to the telephone company and fixing the rates for service never had been abrogated by an improvement in the telephone service, as asserted by the telephone company. The city maintained that the annual rate of \$125 for business telephones, \$100 for residence and \$150 for public telephones in the district bounded by North avenue and Thirty-ninth street and Western avenue and the lake, was the only rate the company had a legal right to charge. Notwithstanding, the company had arbitrarily advanced these rates \$50 on each classification.

As a defense in all the litigation referred to, the company had contended that its arbitrary advance in rates was justified by the improvements which it had instituted in the service. It was contended that under the ordinance of 1889 telephone subscribers had been furnished with a ground circuit, that this had been improved by the establishment of the metallic circuit, and that the subscribers were given an additional advantage in connection with the long distance system, not possible when the original franchise was granted.

The Supreme Court, in its decision, holds that the ordinance, when it was passed, applied to the entire city, with no exclusion of any territory that might come in later. In other words, the provision that the company should not increase its rates to its patrons, had no clause restricting those rates to the then limits of the city. This part of the decision may do away with toll rates to Rogers Park, Irving Park, Austin and other suburbs within the city limits. If it stands, however, the company may perhaps insist on its franchise right of \$25 per mile for every mile beyond the limits of the original grant.

Regarding the company's contention that the improvement in service justified the increase in rates, the court says: "We see no warrant for saying that the terms of the ordinance do not include any improved service adopted by the company. To construe the ordinance as the company would, means that whenever an improvement is made in service the company may rid itself of all its rates and still enjoy the benefit of the franchise."

In concluding its opinion the court holds that the pleas and evidence do not warrant the forfeiture of the franchise, but it directs the lower court to enter orders in accordance with the decision.

In summing up the case the court said: "The limitation that the defendant should not increase to its present or future subscribers within the city of Chicago the rates for telephone service then established, had no provision restricting it to the existing limits of the city. The words of the ordinance are clear and not ambiguous and apply to all territory within the city of Chicago during the entire period of the grant.

"The ordinance, having been accepted by the defendant, became a contract by which both parties were bound and the territory which since has been annexed is within the city of Chicago. If the grants had been for terms of years under legislative authority authorizing them, and the terms had existed beyond the existence of the corporation granting the privileges, there might be ground

for saying the grants were binding upon the city because they had become binding contracts under which the defendant had vested contract rights for such terms. Where the words are not doubtful the courts have no right to annex terms or conditions not agreed to by the parties."

After reviewing the claim that improvements had been made in appliances and that the increased rate would insure better service, the court continued:

"We do not see how it can be said that Chicago, by its ordinance, gave the defendant rights which were not restrained by the limitation of the ordinance, and if the defendant is using the streets of Chicago for a kind of telephone service which is not within the limitation of the ordinance, it certainly is not within the grant.

"The facts alleged in the plea, taken in connection with the charges and information admitted or not denied, would not, in our opinion, warrant the court in declaring a forfeiture of the franchise, but so far as the information charges the defendant with a misuse and abuse of the license and privilege granted by the ordinance and seeks to oust the defendant from the enjoyment of such license and privilege, the plea is not a good defense and the court erred in sustaining the demurrer.

"The views we have expressed will be sufficient for a settlement of all questions involved in the controversy, for the reason that the same principals and rules apply to all of them. The cause will be reversed and remanded."

It is stated that the telephone company has decided to apply to the Supreme Court of Illinois for a rehearing of the case. On what ground the application will be based it is not yet possible to say, but probably one of the grounds will be that the court, in approving the \$125 flat rate throughout the entire city limits, did not, apparently, take the fact into consideration that subscribers in the annexed territory pay a rate of \$18 to \$75 a year, based on the local exchange service, with toll rates to points outside the local exchange. To put these rates up to \$125 a year and add \$25 a mile for every mile beyond the limits of the original grant, would enormously increase the rates to subscribers outside the original limits of the grant. Such is the argument of Charles S. Holt, attorney for the telephone company.

The city claims that under the decision of the Supreme Court it has the right to demand the forfeiture of the remaining three years of the telephone company's franchise and to demand that the company go before the council now and make application for a new franchise on such terms and under such conditions as shall be fair and satisfactory to the city and to the telephone company's subscribers. We have not yet had a chance to read the decision of the court in full, hence cannot form reliable conclusions as to the extent of its meaning. The further progress of the matter will be watched with interest. Should the rehearing be refused, there is a possibility that the telephone company, through some of its eastern stockholders, will carry the matter to the Supreme Court of the United States.

The Woodbine Telephone Company, of Woodbine, Iowa, is rushing its line between Missouri Valley and Honey Creek, where connection will be made with the Independent Telephone Company, of Council Bluffs.

The C. & P. Telephone Company, of Frederick, Md., is extending its line to Harney. It may also be extended to Gettysburg and Littletown, Pa.

## ARE TELEPHONE RATES TOO HIGH

It has been the contention of the Chicago Telephone Company that when they introduced their modern telephone service they were entitled to greater compensation because of the great expense involved in making the change and because the new system was much more expensive to install. While it may be true that the modern system may be much more expensive to install than the old grounded magneto system, it is also true that they could not possibly do the work without an up-to-date exchange. The reason for making the change was because the company could not handle their calls, and the expense for maintenance was so great as to be out of the question. Just imagine for a moment the immense corps of inspectors who used to take care of the batteries. Under the new arrangement all of the talking and signalling power is furnished by a storage battery at the exchange. Of course most of the lines are now complete metallic circuit, but that had to be, because the great difficulty in keeping the grounded lines balanced. It is well known what a noise adjacent electric light and power lines make on any but metallic circuits. It was therefore a bad excuse on the part of the company to say that as they were giving more improved service, they were entitled to more pay. Their new system, when the expenses of maintenance is taken into consideration, costs them less.

How much, then, should be an equitable rate of subscription? The Chicago Telephone Company want \$175.00 for unlimited service and claim that the \$125.00 ordinance prescribed by the city ordinance is so low as to deprive them of a fair return upon their investment. They point to their fine plant all over the city as being worth many millions and then show how their income is a fair percentage on their valuation. They do not tell how this plant was built on the earnings of the exchange, neither do they tell how many times they have issued new stock gratis to the stockholders, so that their dividends might not be suspiciously large. They also do not tell how much more they pay for their plant than should be necessary. The Bell Telephone Company owns a controlling interest in the Chicago Telephone Company, they also own the Western Electric Company. The Chicago Telephone Company at the direction of the Bell Company must buy all of its apparatus from the Western Electric Company at the price stipulated by the Bell. This price is now low it may well be believed.

The Chicago Telephone Company serves a large patronage and on that account it may be admitted that the service now is worth more than it was when there were one half or one fourth the number of subscribers. The major part of the increase has been among the residences and therefore of little benefit to the average business man, so the value of the service does not by any means double with the doubling of the subscription list. At any rate the old rate was far too large so that rate will not serve as a fair basis upon which to calculate.

The exchange has increased in size and extent and the company claims that there is a great increase in the investment per line. It is to be doubted whether the average line in Chicago is any longer now than it was five years ago. The method of the telephone company in building, is such that, as soon as the field of any one exchange increases in size beyond a certain area, a new exchange is established and the lines are redistributed. Thus the length per line remains about the same at all

times. The additional expense per line is increased by the trunking lines which are established between the different exchanges in the city. It will be understood that the proportion of calls trunked as compared to the calls that do not require trunking is very large. In some exchanges the proposition is fully 85 per cent of the total number of connections. The number of trunking lines will not be so much a function of the total number of lines in the exchange, as that of the total number of cord circuits and the location of the switch board. The down town exchanges will of course show the greatest proportion of trunked calls while the outlying exchanges will do business mostly local.

The increase investment therefore is largely in the trunk lines but partly in the increased number of operators required to handle the business, for as the number of lines increase the number of calls per line increase.

What is fair then? We think that a comparison with the rates charged by other Bell and Independent exchanges would be fair, by taking into consideration the different costs per line.

The following are the rates charged in other cities for unlimited service.

Cleveland, Bell \$85.00; Independent, \$72.00.

Denver, \$120.00. (No competition.)

Kansas City, Bell, \$72.00; Independent, \$56.00.

Philadelphia, Bell, \$160.00; Independent, \$81.00.

Rochester, Bell, \$125.00; Independent \$48.00.

St. Louis, Bell, \$90.00; Independent, \$72.00.

It will be observed that in each of the above cases the independent company gives service for the lowest rates. This does not mean that the independent company is not giving good service and are losing money. Each of the independent companies mentioned above are giving the best service to the patrons and they have, by their competition forced the Bell company to improve its service wonderfully.

For example take St. Louis. They have for some years been paying 5 per cent annual dividends to the stockholders after laying aside an ample reserve to take care of depreciation and interest. All this on a \$72.00 rate. From the explanation given above it may be admitted that Chicago should charge more for the service which it gives. How much more is of course, open to argument. We have attempted to show that the lines of the subscriber do not average any longer, therefore no extra charge need be made on that account. We will suppose that the expense for the trunk line increases the investment per line 15 per cent over that of the St. Louis Company, and that the extra expense for operators and attendants will increase the investment another ten per cent, making the cost per line twenty-five per cent greater for Chicago than for the city at the other end of the drainage canal. Chicago would therefore be justified in raising their rates to a point twenty per cent greater than those of St. Louis. This would be just \$90.00.

How about the water in the stock of the Chicago Telephone Company? Desiccate it.

The Home Telephone Co., of Tiffin, O., has enjoyed a very prosperous year and have experienced a steady and satisfactory growth since their organization seven years ago. This company is one of the earliest of Mr. Barber's promotions. Supt. E. R. Strohm is developing the adjacent farm districts with energy and will doubtless soon have his immediate territory well satisfied with efficient service at reasonable cost.



## South Dakotans Meet at Aberdeen

The third annual convention of the South Dakota Independent Telephone Association met at E Sioux Falls, January 10 and 11. The meeting was called to order by President C. B. Kennedy, of Canton, S. D., at 3 P. M. of the first day. The address of welcome was delivered by Mayor Geo. W. Burnside, who is also president of the Citizens' Telephone Company, and who, on behalf of the city, extended a hearty welcome. The mayor stated that he regretted that he was unable to do much for the entertainment of the delegates, as his daughter was dangerously ill and he was unable to leave her bedside.

Following the address of welcome, President Kennedy delivered his annual address. He reviewed the progress of the telephone business in general, drawing an interesting comparison between the use of the telephone and the telegraph, very much in favor of the former. He touched in an interesting way upon recent inventions which have so widely increased the uses of the telephone as a vehicle not only for practical affairs, but for pleasure as well. He pointed out that telephony in South Dakota is not yet very far removed from the beginning of things and that to the present association lies the duty of building the foundations wisely and well in good service and thorough, up-to-date standard equipment. South Dakota, said President Kennedy, is waking up; this association already represents 13,391 telephones; 18,476 miles of iron wire; 6,253 miles of copper wire; 3,640 miles of farmers' lines and 3,314 farmer telephones. The pole lines average about thirty-five poles to the mile. Outside of the association there are 3,874 telephones. In the state there are about 400,000 white people, making about one telephone to each five families in the state. President Kennedy said that the time would come when every other family in the state would have a telephone. He said he believed the telephone to be a natural monopoly; that it behooves the Independents to look well to the service they give, so that it shall be they and not the Bell which will in the end achieve the supremacy.

The following papers were read at the convention: "The Independent Telephone Company," Geo. W. Burnside, Sioux Falls; "Our Duty to the Public," by J. L. W. Zeitlow, Aberdeen, reproduced elsewhere in this issue; "What Constitutes Deterioration," by R. D. Crouthers, Hetland; "The Farmers' Telephone Company," by M. B. Ryan, Beresford; "Would it be to the best interests of the public to compel telephone companies by law to connect with each other?" by Dr. E. R. Buck, Hudson. This paper brought out a lively discussion. Other papers read were, "How to Handle Three Company Business," by T. F. Robinson, Pipestone; "Is it a benefit or a detriment to have two exchanges in the same town?" by W. G. Porter, Sioux Falls; "Who is responsible for the adverse sentiment against existing exchanges?" by J. A. Steninger, Porter; "Relation of the Supply House to the Telephone Company," W. G. Bickelhaupt, Aberdeen.

P. C. Crothers' paper on "Deterioration" showed conclusively that at least ten per cent. of the valuation of a plant should be charged off for deterioration.

W. G. Bickelhaupt's paper on "Our Relation to the

Supply Houses" contended that the latter and the exchange owners and operators should work together harmoniously. He scored the houses that promote rival exchanges and lines against independent owners.

He said that there was a time when the Bell monopoly was the common enemy of the independent owners but that now the manufacturers and supply dealers are more detrimental to the man who invests his money legitimately in the telephone business than the Bell Company ever was and advocated that a resolution be passed making it the duty of every member of the association to report to the secretary the name of any supply house or manufacturer who directly or indirectly promotes rival exchanges or lines established and known as Independent companies or individual operators. After much discussion the resolution was adopted.

Dr. Buck of Hudson favored a law compelling all companies whether friends or otherwise, to connect. This did not take well with the convention apparently for the stated reason that it would be impracticable as well as impossible to render good service and to make proper division of the business unless all parties to a connecting agreement were friendly. A connecting agreement was favored but it should be by mutual consent or contract. It was also stated that a compelled connection would amount to the same as a confiscation of property. As an illustration, where a rival company had sprung up in a certain town because rates charged by the operating company were \$1.50 per month for business houses and \$1.00 per month for residences with day and night service did not suit, and the new company proposed to furnish the same service at a reduction of fifty cents on each of the prices named above but on account of the inability of the last party to secure proper toll line connection the first party was enabled to maintain his exchange when otherwise his property would not have been worth twenty-five cents on the dollar.

The following named persons were elected to serve as officers the ensuing year:

President C. B. Kennedy, Canton, S. D., Vice President, J. A. Steninger, Parker, S. D., Secretary and Treasurer, E. R. Buck, Hudson, S. D., Executive committee, M. J. Ryan, Beresford, George W. Burnside, Sioux Falls, P. R. Crouthers, Bookings and H. P. Hartwell of Irene.

The Independent Telephone Clearing House Company of Iowa, which was organized some time ago to check toll line message business and apportion the earnings of interchanged toll business, has secured a suite of rooms at 410 Locust street, Boone, Ia., engaged Geo. T. Hewes as manager and is now starting in with its work. Arrangements have been made with a large number of Iowa companies to have their business checked, and other companies are fast coming in for the same service.

## MR. HARRIS WRITES TO GLASGOW.

The following letter is self-explanatory:

SALT LAKE CITY, UTAH, Jan. 11, 1906.

Manager Municipal Telephone Exchange,  
Glasgow, Scotland.

My very dear Sir:—

You will perhaps have noticed of late especially in the American telephone publications a growing tendency to attack foreign telephone plants both as to their construction and methods of operation, a great many of the articles published emanating from the pen of Herbert Laws Webb, with an occasional one from others of the same ilk.

These articles are published for the express purpose of creating a spirit of ridicule and sarcasm, pretending to influence public opinion against Municipal Telephony, but underlying all is the "Bell" interest that hides itself behind a more popular subject.

There are two publications of the January issue on my desk at this moment, one of them "Sound Waves", the other "Telephony" both of Chicago. The former in the true spirit of fearless loyalty calls attention to the vicious attacks being made against the Glasgow and other non-Bell plants in Great Britain and setting forth that the Independent men of this country are disloyal to the cause in giving way to the blandishments and alluring deceptions by lending their aid and unconsciously helping the "Bell" interests.

The other "Telephony" comes out with a new installment of ridicule, criticism and sarcasm against the Glasgow and other Independent plants of Scotland. The first excited my curiosity and approval, the second my disgust and wrath.

Being a patron of both publications and a loyal Independent telephone man belonging to the fraternity irrespective of its location, I have written "Sound Waves" a letter commending its course and scoring "Telephony" for thus prostituting its pages in the manner it has. I want you to know my dear sir that the sympathies of the American Independent Telephone men are with you in your fight the common enemy—the Bell.

The Independent telephone men of this world are as one in everything that concerns them in their fight against that greediest of all monopolies—the Bell Telephone Co.

We know no distinction, no difference of object and no cause more worthy of the encouragement and support of each other than the glorious course of Independent Telephony and such attempts as mentioned should serve to still closer cement those ties of fraternity and co-operation.

To the loyal Independent telephone man there is no distinction between the brother who operates the Exchange for a Municipality and he who performs the same tasks for a corporation. Just as long as he is not a Bell Telephone man he must be an Independent telephone man and as such receives the unqualified support and co-operation of his fellows.

I have no sympathy with those carping mortals who are always ready to "knock" (to use an American phrase) any project that they cannot have a part in.

I do not know whether or not you have ever had the good fortune to come in contact with a loyal, energetic, honest, American Independent telephone man, one who loves the cause for the very cause's sake, who sees no good, but everything bad in everything with even a tinge of Bell to it, who will devote his time, resources and knowledge of the business to you, because you are an Independent telephone man.

This spirit has done more to add to the growth of the Independent movement in this country with but one or two exceptions. All over the United States are hundreds of Independent men who have been encouraged and aided until they were strong enough to stand alone. They immediately got out and encouraged and aided others. The moment a man got into the cause he became an enthusiastic missionary to others, and so it has grown until there is not a state in the Union but what has its Independent plants with a magnificent system of toll lines covering almost as much territory as the Bell, while the number of subscribers are over double to that of the Bell, all done in practically 6 years.

I have no wish to make any criticism of any apparatus that you may be using. Mr. Webb ridicules your apparatus and methods. He will do the same for any apparatus not of Bell manufacture. Its his egotistical narrow minded

bias, that sees no telephone apparatus but Bell. It is not very long ago that the Bell Co. in this country was using "Law" apparatus and thought it "par excellence." We of the old rank and file have seen many changes in apparatus in the past 30 years, and let me tell you my good brother in all sincerity that the merest tyro in the manufacture of Independent telephone apparatus in this country is making better apparatus than the Bell Co. ever made.

I say this without fear of contradiction after an experience of 30 years or to be exact 29 years, 23 of which was spent with the Bell Co.

Telephone apparatus has reached its perfection in this country both as regards workmanship, simplicity, efficiency, cost and adaptability. Its rapidity of operation enables the average exchange to render a  $1\frac{1}{2}$  to  $1\frac{3}{4}$  second service and frequently better than that.

I spent 4 years of my 29 building exchanges for the Bell Co. on the continent and while I, like the others, thought each one a model, I can now look back and see how ridiculous our efforts were compared to modern telephony.

There are thousands of Bell plants in Europe and America, and some Independent plants as well that possess fully as many or more idiosyncrasies as Mr. Webb would have us believe prevail in the plants of Great Britain. "People who live in glass houses, etc." There are Bell Exchanges in this country, many of them in Utah, that are unworthy of the name of telephone exchange, in spite of the Bell Company's attempt to pose as the great exponent of modern telephony.

The question that concerns the writer is this. Is there anything I can do for you? Can I be of assistance to you in any way? After almost 30 years of practical experience in the construction, operation and maintenance of plants can I aid you in any manner, either with suggestions, experience or advice?

I shall be only too pleased to give you the benefit of all these and as many more as you may desire.

It is a far cry from Salt Lake City to Glasgow but space is annihilated and the chasm bridged when it comes to fighting the common enemy. I have been fighting them for six years and glory in the fray. Can I help you even at this distance to do the same? If I can be of any assistance do not hesitate to ask it.

I wait your commands and extend my cordial sympathies. Wishing you continued success, I am,

Yours fraternally

C. O. HARRIS,  
Supt. Exchanges.

Utah Independent Telephone Co.

In New York City the Great Eastern Telephone Company, a new Independent concern, has made an application to lay new subways under the franchise recently declared valid. D. A. Reynolds, president of the company, says: "We secured over 29,000 contracts for telephones during January, and now have more than 67,000 as the result of fourteen weeks' canvas. We have filed maps with the department for one exchange in lower Manhattan and one in the Bronx, which will be followed by others. Our orders for material will be placed at once upon receiving our permit."

The report that Col. Frederick S. Dickson, president of the Cuyahoga Telephone Company would resign to accept the management of the brokerage house of A. O. Brown & Co., circulated several days ago causing some excitement in telephone as well as in other business circles has been denied by Mr. Dickson. He makes no promises that he will not leave telephone business in the future but states that at present he has no such intention.

The Co-operative Company, known as the Littleport Farmers' Telephone Company, of Littleport, Iowa, has been dissolved by mutual consent.

A. F. Cronquist has purchased the Erskine Telephone system, at Erskine, Minn., and will extend and improve it.

## WHAT BAFFLED THE TROUBLE-MAN.

BY JOE ARCHER.

It was during the autumn of 1895 or '96, at which date the Farmers' party-line system was yet in the experimental stage of evolution, and the Trouble-Man, due to the very limited scope of his knowledge of the proposition with which he was called upon to deal, quite frequently found himself in the position of the Irishman at a Dutch wedding, that is, he seldom did the right thing at the right time.

An expert telephone engineer was sent by a large supply company to inquire into the trouble which was being experienced by a certain local telephone exchange which was operating in a small country town. This exchange had installed a number of farmers' lines which, for some inexplicable reason, had proven a source of constant annoyance to the local management from the time of their installation.

Upon arriving in the town wherein the exchange was located, the engineer immediately visited the exchange and proceeded to investigate the matters complained of, in accordance with the suggestions of the local trouble-man.

The major complaint was that the subscribers could not "get Central." The operator stated that in one or two cases she was able to hear the subscribers call, but was unable to elicit any response from this calling subscriber upon her making inquiry as to what number was wanted.

After a thorough investigation the engineer was convinced that the trouble complained of existed in the telephones and not in the switchboard, as was believed by the local management. The management thereupon agreed to drive him into the country, at their own expense, for a distance of some eight or ten miles for the purpose of discovering the real cause of the dissatisfaction.

The drive was made, and the trouble-man finally drew rein in front of a large and somewhat dilapidated farmhouse of the up-country type.

"This is where the 'main kicker' lives," he remarked as he hitched the horse to a fencepost. "If something doesn't develop here, I shall think you were working the company for a buggy-ride." "Good morning, Mr. Biggsby," he hailed, saluting a grizzled old farmer who shamled out to meet them.

"'Morning,' Mr. Trout. Tol'able fine day."

"You're right for once, Mr. Biggsby. Shake hands with Mr. Carliss. Mr. Carliss is a telephone expert, and he wants to have a look at your telephone and see if he can't put it in better working order."

"Wa'al, now. A telephone expert, eh. Kin fix a telerhphone by lookin' at it kin 'e. Mr. Carliss, glad to make yer 'quaintance," drawled the farmer shaking the proffered hand cordially. "Come right int' th' house," he added, leading the way. "That gol durned elect'ical device has done more to promote th' cause o' perfanity 'round here then all th' blasted crop failures I ever had. Hope ye kin fix it, that's all th' bad luck I'm a wishin' ye."

"We'll take a look at the thing anyway," remarked the engineer.

"Wa'al, that's proba'ly all its a needin'," replied the old man interestedly.

The engineer gave the generator crank a vigorous turn and put the receiver to his ear. He noted that the ringer responded but feebly.

"Has any one ever tinkered with the mechanism at all?" he asked, looking at the farmer.

"Tinkered with the what?"

"The mechanism," repeated the engineer pointing to the telephone box.

"Wa'al, no, I don't think so. There's my boy Zekial. He's a kind uv a geenyus in a way. He had the insides out o' th' ear trumpet a couple o' times, an' had th' front out o' th' talkin' box er 'smitter as he called it, and them two ginger boxes, I guess he took them out once er twice, but I don't think he ever tinkered with th' mechanism any."

"I see," remarked the expert with a side wink at the trouble-man. Did he ever have them all apart at one time?"

"Did yu', Zekial, ever have the ear-trumpet and th' talking box to pieces at th' same time?" the farmer asked, turning to a thick-set, long-haired, chip off of the old block, who had become a self-appointed and much interested member of the investigation committee.

"Wa'al, I reckon I did a couple o' times, Dad, that time when 'Sal' mixed 'em all up fer me when I was out a drivin' th' blame' pigs out o' th' 'tater patch, but I got em all back again all right."

"'Blieve yu' did that time," admitted the paternal member reflectively.

"I see," repeated the engineer as he removed the cover from the end of the receiver and examined the diaphragm critically. Then he removed the front of the transmitter and examined it carefully, scratching it slightly with his knife-blade.

He next removed the diaphragm from the transmitter and laid it carefully to one side and proceeded to examine the carbon cup, which was only about half full of caked granules.

"Bad looking carbon," he remarked. "Did you ever take the carbon out at any time?"

"Did yu', Zekial?" persisted the father.

Zekial shifted his weight from one foot to the other, ran both hands into his trousers pockets and grinned, questioningly at the trouble-man.

"Th' powder, d'ye mean?"

"Yes. The powder."

The youthful mechanic scratched the rag carpet vigorously with his boot-sole.

"W'y you 'know, Pap, I got th' rifle down to shoot that 'are houn' uv old Bud Johnson's that was a prowlin' around after th' sheep, an there wasn't any powder in th' powderhorn, so I jist ups and takes some out o' that 'smitter to load th' gun with. I intended to put it back as soon as we got sum more, but we aint been to town since, none uv us."

"Did you kill the dog?" questioned the engineer, smiling slightly.

"Naw. Th' danged thing wouldn't go off fer love ner money. Th' load's in th' barrel yit."

"Packed it too tight," remarked the engineer. "Talkin' powder won't stand much packing."

"I kin git yu' th' powder agin if yu' want it," said Zekial as he disappeared from the room.

The engineer took up the diaphragm which he had laid aside and placed it upon the receiver and carefully adjusted it, and then replaced the cover, after which he turned his attention to the transmitter. He broke the

cakes of carbon into small granules and cleaned the diaphragm which he had taken from the receiver.

By the time he had completed this task, the youth reappeared bearing a handful of granules which he had extracted from the muzzle of the rifle.

This the telephone man examined and finally poured into the transmitter cup.

"Is that all the 'fixing' you ever did to the instrument?" he inquired.

"You never monkeyed with th' mechanism did yu', Zekial?" reiterated the senior Biggsby.

"Th' grinder thing, d'ye mean?"

"Yes. The grinder," urged Carliss.

"Oh, I took a little piece o' that green wire off o' th' spool in there won't to wire th' buck-saw, but it didn't look zif it was stout enough, so I put it back agin an' its jist as good as ever."

"You put it back, eh?" quizzed the expert.

He removed the armature from the generator and examined the windings. The wire had been put back as stated, the same being tied at each end regardless of the insulation. It was due to the small breaks or scratches in the insulation that the current could leak through enough to make a very weak connection. This, then, accounted for the feeble response of the ringer.

The engineer scratched the insulation from the wire ends and spliced them properly and wrapped the splices with insulating tape. Then he re-adjusted the transmitter, and examined all the other connections, binding posts, etc.

After readjusting the ringer gongs, he gave the generator crank another vigorous twist. The bell responded normally. He took down the receiver and listened in.

"Central" sounded through the transmitter loudly enough to be heard distinctly by the bystanders.

"Hello, Central, you hear me all right, do you? This is Carliss. Just trying a 'phone, that's all. Goodbye."

I guess it will work better now," he added. "My advice to you," he continued, turning to the youthful mechanic, "is that you turn your experimental energy to medical research in the future, and practice on the chickens. You would undoubtedly make a good surgeon."

"Wa'al, now! Do yu' really think Zekial would be after makin' a real-fer-sure surgin?"

"I haven't the slightest doubt of it," assured the engineer.

"An appendicitis specialist, judging from the way he goes for the insides of things," interposed the troubleman.

After a short discussion of things in general, the telephone men drove away.

"By Jing!" ejaculated the engineer slapping his knee, "This farmers' line proposition is surely a growing one, not only from the stand-point of resources, but of liabilities as well."

"Providence was with the dog in this case," ventured the trouble-man, and the two laughed heartily.

[NOTE:—Mr. Archer states that the interchange of the receiver and transmitter diaphragms was possible in the old rubber-case transmitters in use some years ago.]

The Eureka Electric Company, of Genoa, Illinois, reports heavy sales on their Carter Improved Test Sets. This instrument is sent on thirty days' trial. It will pay to investigate the merits of this test set, for it has several advantages over the common lineman's test set. The company will be pleased to send illustrative and descriptive matter on this instrument promptly on receipt of request.

## SIXTH MISSOURI MEETS TODAY.

About twenty-five members of the Western Missouri Independent Telephone Association, District No. 6, of the Missouri Independent Telephone Association, met on February 9, at the Hotel Kupper, in Kansas City.

The Western District comprises Jackson, Platte, Lafayette, Johnson, Hickory, Cass, Bates, Henry, St. Clair, Benton and Pettis Counties, in which there are about fifteen companies, operating about thirty exchanges, exclusive of numerous so-called "farmers' exchanges. Those who attended the meeting were:

James F. Barnett, Rutledge; Geo. W. Schweeter, Windsor; W. S. Oglesby, Lamont; J. F. Moore, Odessa; W. T. McLurin, Oak Grove; Edward Foote, S. P. Piper, Pleasant Hill; E. A. Hook, Appleton City; W. B. Scruggs, Harrisonville; R. A. De Atley, Blue Springs; Henry Reinheimer, Butler; J. H. Smith and T. E. Wright, Chillicothe; B. C. Hyder, Brookfield; S. E. Cheney, Independence; A. L. Cooper, Garden City; F. E. Taggart, Richmond; T. L. Dunlap, Neosho; C. J. Meyer and A. Major, Kansas City.

It was decided at the meeting to merge the thirty or more Independent exchanges comprising District No. 6. This action was determined on because of the purchase by the Missouri and Kansas Company of several exchanges, which incidentally resulted in the resignation of F. W. Buffum, of Louisiana, Mo., president of the State Association. This resignation was communicated to the meeting and advances Vice President W. B. Scruggs, of Harrisonville, who was present at the meeting, to the presidency, at least temporarily.

Traveling Secretary James S. Barnett is quoted as saying: "There is no doubt we are in for a war to the finish. The Bell is buying steadily, paying whatever price is asked when they believe the plant sought to be important to our long distance connections."

"The sympathy of small communities is with home capital invested in Independent companies, and the patronage goes with the sympathy. Unable to win in open competition, the Missouri-Kansas Company is now seeking to buy out well-established Independent companies, thereby breaking up our long-distance connections."

"The Missouri Independent Association is divided into nine divisions or districts. Nearly all of these have suffered somewhat by desertions of companies to the Bell. Among the plants the Bell has bought are Kirksville, Lancaster, Carrollton, Brookfield, Linneas, Unionville, Marceline, Fayetteville, Edina, Moberly, Mexico, Montgomery City, Columbia and Higginsville.

"But the Bell Company seems to be buying a good deal of old junk. And every time they buy up an old plant and franchise a new Independent concern starts in with a new plant and a new franchise."

"The Bell bought out the Lancaster plant for \$5,000. We believe it to be worth about \$1,500. A new Independent company has been organized there, a franchise secured, and the switchboard is already in. Kirksville sold the Bell people a \$15,000 plant for \$50,000, and an Independent company already has a new franchise and is stringing its wires. Seventy-five thousand dollars was paid for the system at Fayette, \$80,000 for that at Brookfield, and \$90,000 for the Car-



rollton plant. We were told at the meeting that the Independents made \$20,000 clear from the sale of the Brookfield, Unionville, Linneas and Marceline interests to the Bell Company; and franchises have already been filed at Brookfield for a new Independent telephone company, covering these four towns. At Carrollton the Home Telephone Company has just been granted a franchise for the whole county. And Carrollton is the only plant where the Bell people got anything like the value of their money.

Mr. Barnett says: "The Bell has spent over a million dollars and has options on over a million dollars' worth more in Missouri. We have got them desperate; I think they will 'bust' wide open before they are done. They are paying very high prices."

One of the main objects of the company was to effect the merger referred to in the foregoing portion of this report, and a resolution setting forth the advantages of such a move in the matter of lessened expenses, was adopted.

Another important matter discussed was the long-distance line from Clinton to Springfield. Satisfactory progress in the construction of this line by the Kinloch Company of St. Louis, was reported. The long-distance connections in Kansas City will be through the Home Telephone Company, which owns exchanges in several of the smaller cities.

A committee of three was provided for, which will appraise the property of the various exchanges to be merged and on the value and condition of these plants the stock in the new company will be based.

President Buffum, who resigned, was the owner of fifteen exchanges, small and large, but when these were transferred to the Missouri and Kansas Company, after the negotiations with the Kinloch Company fell through, there was nothing for Mr. Buffum to do but to resign.

#### Fire Underwriters Approve Cook Protectors.

Frank B. Cook announces that he has received the approval of the National Board of Fire Underwriters on his Type B-4 Subscribers' Station Protector, and that he is now in a position to furnish a device which combines all the most approved forms of protection, and which may be installed in residences or buildings, with the full approval of the underwriters' inspectors.

The Type B-4 protector is equipped with Cook's new tubular fuses, with improved carbon lightning arresters, and with sensitive heat coils. All parts are mounted on heavy porcelain base.

Cook's new tubular fuse does not explode, does not give a flash, and does not continue the arc when blown. These fuses protect against heavy currents.

The improved carbon lightning arrester is provided with a perforate celluloid dielectric, in which the perforations are so small and so numerous that the discharge is greatly broken up, and is forced to pass through the arrester at many points.

This prevents particles of carbon from breaking off and short-circuiting the arrester. The celluloid do not vary in thickness, and are consequently uniform and reliable in their operation.

If an arc continues through the arrester, due to a cross with a high voltage circuit, the celluloids will melt and allow the springs to press the carbon blocks together and form a dead ground through the arrester,

This stops the arc, after which, if the current increases sufficiently, the tubular fuse will blow and entirely cut out the instrument from the circuit.

The exposed surface of one carbon is insulated with an enamel, which prevents a short circuit from occurring at the exterior surface of the arrester. The fuses are clamped in place by a very simple spring device, which holds them securely and insures perfect contact.

The sensitive heat coils protect against sneak currents. It is a very simple matter to arrest the coils after they have operated.

The lightning arresters and heat coils are protected from dust and dirt by a glass cover. The cover also protects curtains and other inflammable material from coming in contact with the arrester, and also protects the subscriber from meddling with the heat coils or carbons.

Cook's Type B-4 protector furnishes complete protection from lightning and from all forms of electric currents which may come over the line. It is designed to be placed inside of the building, and is so well made that it is really an ornament to any house or office.

#### Stock Changes Hands.

A. T. Averil and G. M. Averill, both of Cedar Rapids, Iowa, are now the owners of half of the \$46,000 capital stock of the Johnson County Iowa Telephone Company. The meeting following the deal resulted in the selection of A. T. Averil, President; S. W. Mercer, Vice-President and Jay Chatham, Secretary and Treasurer. These men, together with G. M. Averil and H. A. McDonald, of West Liberty, constitute the board of directors. The retiring stockholders were all Wisconsin men and the purchasers are men interested in Cedar Rapids telephone plants. E. H. Sidwell, who succeeds E. T. Preston as manager, has previously been with the Cedar Rapids and Marion telephone companies at Cogdon and will at once proceed to install new instruments and switchboards.

Fire at Irene, S. D., January 20, destroying the plant of the Independent Telephone Company and also some other valuable property. The loss will not materially injure the independent interests, however, as work of rebuilding was resumed at once and under the management of such energetic men as compose the South Dakota opposition to the Bell, even fire could not permanently injure the cause in that vicinity.

Publishers of Sound Waves note with pleasure the many expressions of appreciation of the technical matter appearing in these columns the past few months. This matter is prepared by the best scientific writers the country affords and the frequent letters of approval received only encourages the publishers to greater efforts in this direction and amply reward them for the extra time, efforts and expense involved in sustaining this department.

The Hardin County Telephone Company, of Elizabethtown, Ill., has been incorporated with a capital stock of \$6,000: Incorporators: Tudorf O. White, Daniel W. Whittenberg and Robert Thacker.

The Farmers' Mutual Telephone Company, of Joliet, Ill., has elected the following officers: President, George Dorward; secretary, Howard Leonard; treasurer, Asa Culp.

## West Virginia Independents Meet

The State Association of Independent Telephone Companies of West Virginia met at Parkersburg, W. Va., February 22-23. Delegates were in attendance from all over the State, the Ohio Valley from Pittsburg to Cincinnati, and from Western Maryland and Pennsylvania. The Independents now control 18,000 phones to their opponents 6,000 in West Virginia alone. The situation from an Independent standpoint is a promising one and this meeting attended by some of the most prominent telephone men in the country, was one of importance to the cause. The convention was called to order by the president, J. Walter Barnes, after which the minutes of the preceding meeting were read by Secretary A. C. Davis.

President Barnes, of Fairmont, who is General Manager Consolidated Telephone Company, then gave his address.

Frank B. Hall, of Wheeling, whose subject was "Standard Construction," was unable to be present and Mr. Handlan, of the same city, read his paper. The writer took up the various classes of construction noticeable in use by independent telephone companies, some of which are up to a proper standard, while some in many instances are inferior. As a remedy he suggested that the National Committee be authorized to adopt specifications for the various departments of construction and to adopt a standard of materials to be used. He urged strongly the standardizing of construction in order that the independent telephone system may be brought up to the highest proficiency.

Following the reading of the paper President Barnes called for a discussion of the subject of the above paper. Mr. Handlan, who is connected with the National Telephone Company of Wheeling, spoke of the benefits that had been derived by the interests with which he is associated in an expenditure of money for a high standard of construction.

A. B. Kratz, of Gallipolis, Ohio, then made some very interesting suggestions along the same line.

Short talks on the local situation were made when the roll call of members was made. Without exception all reported improvement and in some instances more business was offered than could be taken care of.

Secretary Davis stated that the members of the West Virginia Independent Telephone Association have 17,271 telephones and the Bell 7,832 phones in the same territory, the companies having 5,496 miles of metallic toll line circuits.

Other telephone companies represented in the Association, who were called upon for remarks, were Mr. Doudna, of the Belmont Telephone Company, Belmont, Ohio; Dr. Smith, of Clarington Telephone Company, Clarington, Ohio; Dr. Jones, of the Athens Telephone Company, Athens, Ohio; W. H. H. Jett, Marietta Telephone Company; R. O. Wooster, Caldwell and Marietta Telephone Company; J. W. Marshall, Hartley Telephone Company; W. M. Haynes, Enterprise Telephone Company, New Martinsville.

Among those registered were:

John T. Harris, Parkersburg; John Kennedy, Boothsville Telephone Company; S. Beeghley, Beeghley Telephone Company, Weston; F. W. King, Stromberg-Carlson Telephone Mfg. Company, Rochester, N. Y.; Ben H. Butcher, W. Va. W. Telephone Company, Parkersburg; J. W. Downs,

Buckhannon Telephone Company; Wirt Seersher, Beeghley Telephone Company, Jane Lee, W. Va.; S. E. Billingsley, Buckhannon Telephone Company; D. L. Porter, Post Glover Electric Company, Cincinnati; Elliott Reynolds, Doubleday Hill Electric Co., Pittsburg; J. B. Henderson, W. Va. W. Telephone Co., Williamstown; B. J. Farrell, Exchange Telephone Company, Littleton; E. K. Hertford, Charleston Home Telephone Company; O. T. Kimmul, Kellogg Switch Board and Supply Company, Cleveland, Ohio; J. C. Boush, U. S. Telephone Company, Cleveland; R. O. Wooster, Caldwell, Marietta Telephone Company; R. A. Little, W. Va. W. Telephone Co., Parkersburg; M. C. DeWolf, Citizens Telephone Company, Racine, Ohio; W. H. H. Jett, Marietta-Caldwell Telephone Co., Marietta; H. M. Smith, Clarington Home Telephone Co., Clarington, O.; William Bentley, W. Va. W. Telephone Co., Parkersburg; C. T. Hiteshow, W. Va. W. Telephone Co.; Frank Hart, P. & A. Telephone Co., Pittsburg; E. D. Schade, Johnstown Telephone Company, Johnstown, Pa.; George F. Myers, Standard Electric Company, Cincinnati, Ohio.

W. E. Peters, Anthems Home Telephone Co., Anthems; C. S. Winston, Chicago; A. F. Poole and J. F. Trasher, Mountain State Electric Co., Wheeling; A. Pohlman, Baltimore; D. H. Leonard, G. B. Gibbens, J. M. Senseman, Parkersburg; L. L. Long, Mt. Morris Telephone Exchange Co., Mt. Morris, Pa.; Hugh Amos, Weston Central Telephone Co., Burnsville; E. J. Moore, Farmers Telephone Company, Pt. Marion, Pa.; James A. McHenry, Western Maryland Telephone Co., Cumberland; E. B. Terry, The F. Bissell Co., Toledo; C. W. Hunt, The Williams Telephone and Supply Co., Cleveland; John Richards, W. Va., Weston, Williamstown; F. P. Ames, Home Telephone Co., Rockland, Ohio; James Drain, Home Telephone Co., Belpre; A. L. Gracey, Marietta Telephone Company; W. H. Rutherford, W. Va. Western Telephone Co., Petroleum.

W. C. Handlin, of Wheeling, under the head of new business, offered a resolution, which was adopted, that the telephone companies in other states in counties bordering on West Virginia, be invited to become associate members of this association, and to have a voice in its meetings, their dues to be just one-half of that charged the resident members.

On motion of A. C. Davis, of Parkersburg, the president appointed W. C. Handlan, J. W. Downs, and A. B. Kratz as a committee of three on standardization to act with a like committee of the National Interstate Telephone Association.

The president reported the appointment of the following regular committees:

Legislation and Litigation—Frank P. Moats, John A. Howard and A. C. Davis.

Resolutions—W. C. Handlan, J. U. Jolliffe and L. H. Bours.

Nominations—J. H. Liniger, B. J. Farrell and S. E. Billington.

### THE EVENING SESSION.

The address of welcome was delivered Thursday evening by Mayor D. H. Leonard, who said that the people of Parkersburg were enthusiastic on the matter of independent telephones. He spoke of the situation in that city and welcomed the delegates.

President Barnes responded with a neat address, making a point of the fact that the city is noted for its support of the West Virginia Western Telephone Company.

"The Right of Territory," by A. C. Davis, General Manager of the West Virginia Western Telephone Company, was the first on the program at the opening of the session Friday morning. It follows:

"No department of the Independent Telephone business in West Virginia needs the attention of the convention more than that of our Rights of Territory. The subject necessarily involves many conditions and subdivisions.

"We might trace the rights of territory from the days of the wandering tribes of Israel, and from the King's chartered territorial grants down to the present day without throwing light on the subject as it effects independent telephony. The subject will be dealt with as it affects the independent telephone movement in West Virginia.

"Years ago the Bell Telephone Company possessed the whole territory of the United States and Canada, but did not develop or occupy it. The large cities, towns and villages only were developed. Protected by patents of questionable issue, it became arrogant, selfish, dominant and grew corpulent on the money filched from the public by extortion. The demands of the public for telephone service were not heeded.

"Deprived of the greatest convenience of modern civilization the people began to erect and build telephone lines and occupy the territory not developed by the Bell Telephone Company. Not until the independent movement set in earnest did the Bell Company make any attempt to develop the unoccupied rural territory, and not until two million telephones were installed by independent companies in the United States did the Bell Company wake up. It still hears the echo from every city, town and village in the State of West Virginia.

"The independent movement is of the people and for the people. They must stand together, forming a coalition and union that cannot be shaken by the common enemy of independent telephony. There is territory enough for you all and your rights to keep and develop it are safeguarded and protected by this association. You have no rights of territory that the Bell Company respects; yet it is remarkable what they are now offering independents in the way of sub-license contracts, and other schemes to make a breach in your territory.

"Diverting a little from the subject, I want to pay my respects to the 'parasites' that are preying upon the territory of the independents in this state. These human vultures are not engaged in telephone business for profit, but are like vermin infesting your household, spreading disease, discord, and strife. Like a serpent they creep upon your territory in the night time, and with the sting of an adder, strike at the vitals of your business. They are sometimes the offspring of the Bell Telephone Company, created to harass the independents, and, by the use of certain subsidized Bell equipments are given long distance connection; sometimes they are the creation of disreputable manufacturers; sometimes they are born of strife and dissension among the independents themselves over divisions of territory.

"Let the old line companies stand together, shoulder to shoulder; let the spirit of give and take control your actions as to disputed territory. If for any cause you cannot develop the territory properly belonging to you, encourage the organization of a local company to develop it; giving a fair contract for connection with your exchange.

"The smaller companies have not, for financial reasons, been able to develop it. Not only this, but this part of the State is cursed with a Judas who has a mania of sub-license Bell contracts. The Bluefield territory in the southern part of the State and the Eastern Panhandle have especially suffered in the loss of territory. Our weak-kneed neighbors are like a few men found in every community—poor souls, can't help it—they betray their fel-

lows for a few pieces of filthy lucre. Turn the lights on and you see them as they are. They leave your community to buy their goods; invest their earnings in foreign securities, and go to the Bell-ridden city of baked beans for their telephone service.

"Rid the business of them! When the business is backed by men who are true to the cause you will see every inch of unoccupied territory in the State of West Virginia fully developed, and a business established that cannot be taken by a gigantic corporation which seeks, not by fair and honest competition, to destroy your business, but by falsehood, misrepresentations, and the power of wealth, to crush it.

"Gentlemen, your State organization is backed by men who have devoted years of their lives to the business—men who have been tried and found true. The affairs of the independents of the State of West Virginia will be nurtured and protected by them. Have faith and confidence in your fellow associates in the development of your native State. Push! Push! Keep pushing! United we conquer; and, guided by the hand of past experience, independent telephony will ride the rough waves of opposition; steer off of the stormy capes of financial disaster and enter a non-Bell port of commercial peace and prosperity where the rights of territory do not disturb us."

Mr. Lloyd Beeghley, General Manager Beeghley Telephone Company, who was to make an address on "Rural Lines," failed to prepare a paper and the number was passed to E. K. Hertford, manager Charleston Telephone Company, who read his paper on "Switchboard Operation." Mr. Hertford under this subject took up the matter of better operation of the switchboard and suggested that attention should be given to correct the defects of the service of operators. He further spoke of the benefit that would be derived from the employment of a higher class of operators. He also referred to the importance of the manager giving personal attention to the operation of the switchboard.

The discussion on this paper was opened by President Barnes, who spoke in relation to the wages of telephone operators. He advocated better pay for the operators and a careful selection of this class of employees. Many of the operators, he stated, could secure better pay in working for private families.

At the close of this discussion the report of the executive committee on the matter that had been presented to them relative to the Burton and Mannington Telephone company, was called for. W. C. Handlan of Wheeling, gave the report of the committee and in doing so he stated that complaints had been filed with the committee by the Cameron Telephone Company. The Wadestown Telephone Company and the Exchange Telephone Company of Littleton, that the above company, has lines on its switchboard that are not in harmony with the interests of the members of this association.

The committee has notified the Burton and Mannington Telephone Company that unless they discontinue the connections with the lines complained of that all members of this association will discontinue service with them at noon on March 3.

W. M. Haynes of the Enterprise Telephone Company of New Martinsville, suggested a discussion of the division of toll rates and opened the discussion followed by Mr. Handlan, of Wheeling, who talked at some length, and others talked briefly on the subject.

#### AFTERNOON SESSION.

The first matter taken up at the afternoon session was the reading of letters and telegrams from prominent tele-

phone men, expressing their regret for being unable to attend.

The reports of the regular committees were called for, the first being the report of the committee on resolutions. It expressed a vote of thanks to all Parkersburg people who were active in making the convention a success and urging all independent companies in the State to become members of the association.

The next committee reported the following nominations:

President—W. C. Handlan, of Wheeling.

Vice President, 1st District—J. H. Wise, of Cameron.

Vice President, 2nd District—W. M. Cayton, of Parsons.

Vice President, 3rd District—J. W. Downs, of Buckhannon.

Vice President, 4th District—Hugh Amos, of Burnsville.

Vice President, 5th District—Lon H. Hutchinson, of Huntington.

Secretary—A. C. Davis, of Parkersburg.

Treasurer—Lloyd Beeghley, of Weston.

Secretary Davis was directed to cast the vote of the association for the officers named and they were declared duly elected.

The election of delegates and alternates to the convention of the National Interstate Association, resulted as follows:

Delegates—Lon H. Hutchinson, of Huntington; W. C. Handlan, of Wheeling; and A. C. Davis, of Parkersburg.

Alternates—A. B. Kratz, of Gallipolis; E. K. Hertford, of Charleston, and L. H. Bowers, of Mt. Pleasant.

The committee on standard construction was directed to confer with competent engineers relative to specifications for construction for use by companies in this association.

W. C. Handlan, of Wheeling, read a paper on "Independent Telephone Securities," which was particularly interesting. He was followed by Lon H. Hutchinson, of Huntington, with also an interesting paper entitled "The Ideal Manager."

Other questions that were brought up for discussion were: "Depreciation—How Charged?" "Successful Soliciting," "Economy of Operation," "Standardization of Apparatus," "Traffic—How Handled?" "Our Emblem," "Tri-State Toll Association," "Telephone Revenues," "Improvement of Local Toll Connections," "How Can We Improve Our Local Telephone Service?"

The two days' convention closed with a fine banquet at the Chancellor Hotel.

Among the well-known independent telephone men present and companies represented at the meeting were:

H. H. Berge, Jackson, Minn.; C. H. Smith, Sioux City, Iowa; P. C. Cockrell, Sioux City, Iowa; J. A. Richardson and L. L. C. Brooks, Minneapolis, Minn.; C. C. King, Scotland, S. D.; Guenther & Sons, Freeman, S. D.; Letcher Telephone Company, Letcher, S. D.; North Lincoln Tel. Co., Harrisburg, S. D.; M. V. Olson, Viborg, S. D.; Electric Telephone Company, Volin, S. D.; G. W. Laing, Bridgewater, S. D.; F. A. Patton, Artesian, S. D.; Chas. E. Wisord, Madison, S. D.; Fred Strunt, Irene, S. D.; (The County Telephone Co.); H. P. Hartwell, Irene, S. D.; N. A. Anderson, Burbank, S. D.; A. P. Hoord, Allester, S. D.; H. Hofmeister, White Lake, S. D.; J. C. Johnson, Lake Preston, S. D.; C. B. Miller, Egan, S. D.; W. E. Egge, Centerville, S. D.; J. A. Steninger, Steninger Tel. Co., Parker, S. D.; P. A. Zollman, Hanson County Tel. Co., Alexandria; E. A. Bruce, Independent Tel. Co., Yankton, S. D.; N. E. Gibbins, Yankton, Tel. Co., Yankton, S. D.; Wm. Gerkie, Lennox Tel. Co., Lennox; T. F. Robinson, Pipestone, Minn.; L. F. Lundy,

Castlewood; W. Thompson, Brookings; P. R. Crouthers, Brookings; C. C. Maxwell, Arlington; H. Mauch, Hetland; E. D. Julius, Davis; E. L. Ketcham, Jefferson; J. L. W. Zietlow, Aberdeen; C. B. Kennedy, Canton; D. S. Waldo, Canton; A. S. Hall, Redfield; W. G. Bickelhaup, Aberdeen; Geo. S. Tussey, Aberdeen; J. A. Zietlow, Aberdeen; M. B. Ryan, Beresford; B. W. Burnett, Tyndall; Fred J. Meier, Chancellor, S. D.; P. W. Goodman, Vought-Berger Co., La Crosse, Wis.; A. J. Carter, Monarch Tel. Mfg. Co., Chicago, Ill.; S. B. Howorth, St. Paul Electric Co., St. Paul, Minn.; C. McIntyre, Illinois Electric Co., Chicago, Ill.; Howard M. Eldred, Standard Telephone & Electric Co., Milwaukee, Wis.; F. H. Jones, Interstate Supply Co., Sioux City, Iowa; R. F. Brown, Miller Anchor Co., Norwalk, Ohio.

## SOUTHEASTERN IOWA INDEPENDENTS MEET.

A special meeting of representatives of the Southeastern Iowa Telephone Association met in the convention room of the Hotel Delano at Burlington, Iowa, Feb. 22, for the purpose of considering the adoption of a new constitution conforming with the National Interstate Association of which they are a part. Owing to the consolidation of the National Telephone Association with the Interstate Association which was effected a short time ago, under the name of the National Interstate Telephone Association it became necessary for the Southeastern Iowa Telephone Association to change their constitution so as to conform with the new head body. It is for this purpose that this special session was called. O. H. Seifert of Eddyville, vice-president, was present and secretary and treasurer W. H. Fowler of Pella occupied the secretary's chair. After a short preliminary in the morning the session adjourned until afternoon when the president E. E. England of Mt. Pleasant called the meeting to order.

Geo. T. Hewes, manager of the Independent Telephone Clearing House of Des Moines then made an address on "Toll Lines." The independent lines in Iowa now have 2,800 miles of toll lines in operation, in that each company has connections with the others and have access to the cities reached by each line. In this way they are much stronger in Iowa than the Bell Telephone Company. According to statistics given, the Bell Telephone Company has but 26,000 phones in operation in the state while the independent companies have a total of 165,000 phones in use.

In speaking of the importance of independent companies to Burlington, Mr. Fowler, secretary of the association said: "The independent lines are of immense importance to the wholesale houses of Burlington as it gives them access to hundreds of little towns which the Bell Telephone company has no connections with. It is well known that wherever a merchant has a phone he telephones in orders to the larger cities so the wholesale houses reap the benefits of the extension of the telephone systems."

"In regard to the fight that the Bell Telephone Company is making on the independent people, it is not scaring us any as it has been on for several months and has not done us any damage, instead, we have been increasing right along. The independent companies are the stronger in Iowa and will be able to survive any force which is applied by this company."

The association was represented by forty delegates representing between 12,000 to 15,000 phones of independent companies. There are 35,000 independent phones in the southeastern Iowa district, while in Illinois, Galesburg, Monmouth and other places there are



as many more independent 'phones. In all 2,600 miles of toll lines were represented at this meeting. The city of Burlington is in the very center of this district and local wholesalers and other business men have connection through the Mississippi Valley Telephone company, with at least 35,000 'phones in this one district.

The work done at this meeting was that of perfecting one more link in the chain of national organization of independent telephone lines, which it is the intention of the independent telephone managers to extend in every direction. The meetings of this association are generally held at Ottumwa on account of the general location of that city with reference to the boundaries of the territory covered by the organization but Burlington was chosen for a change.

The election of officers resulted as follows:—

E. E. England, of Mt. Pleasant, president; F. Purchase, of the Mississippi Valley Telephone Co., of Burlington, first vice-president; O. H. Seifert, of Eddyville, second vice-president; C. A. Farrington, of Centerville, third vice-president; J. S. Bellamy, of Knoxville, fourth vice president; L. D. Robinson, of Winfield, fifth vice president; W. H. Fowler, of Pella, secretary and treasurer.

The regular time for holding meetings of this association is in October but business of importance necessitated this special session which, however, will not interfere with the October convention.

### Co-operation Necessary to Defeat Bills.

The following letter has been sent to each Independent Telephone Company in the state of Ohio, requesting their support in defeating certain bills that have been introduced in the Senate and House:

Columbus, Ohio, Feb. 21, 1906.

"Dear Sir: In reference to legislative matters, I beg to say to you that the following bills have been introduced and are pending and need attention at the hands of telephone people:

First: House Bill No. 76 by Mr. Hillenkamp, which authorizes councils of cities and villages to regulate and fix by ordinance the price and rate of telephone service, and the granting to such cities and villages of free telephones, not to exceed twenty-five. In the event that this bill is reported from the cities committee, it would be necessary that each representative be talked to and made to understand how utterly impossible it would be to operate a telephone system with a law enacted of this character.

Second: House Bill No. 171, by Mr. Aikin, which amends section 3471, revised statutes, by providing that the authorities of a municipal corporation, at the time they authorize a mode of use, or at the time any new contract, as to the said mode of use is entered into, to enter into a contract with a telephone company, by which the rate of telephone charges to its patrons may be fixed for itself and its successors, which in effect, is a bill authorizing and fixing telephone rates.

Third: House Bill No. 173, by Mr. Paine. This is a bill amending certain sections of the municipal code, and contains a number of sections. Section 122 A. of this act provides for the submission to the voters of a city before an ordinance or resolution, granting a franchise or creating a right, shall become operative, upon the filing of a petition with council of ten per cent. of the qualified electors of the city. This, in effect provides for municipal ownership as well as referendum. It also contains a section giving the right to city and village councils to put all telephone, telegraph and electric light wires under ground, and this would be a burden which no exchange operating in cities, towns or villages could stand.

Fourth: House Bill No. 329, by Mr. Ely, compelling all telephone companies to connect their respective exchanges. This would compel Independent plants to give all Bell exchanges their full service and vice versa, without additional cost, and would eliminate the Independent tele-

phone company as a factor in the business, Mr. Ely, two years ago, introduced this identical bill, but it was overwhelmingly repudiated by the committee to whom it was sent; but there is a strong effort made to revive this proposition and put it through.

Fifth: House Bill No. 328, by Mr. Pears, reducing the hours of labor of telephone and telegraph operators to eight hours.

Sixth: Senate Bill No. 131 has the same foundation as the Senate Bill No. 162, by Mr. Vanover, but is so far-reaching as to absolutely revolutionize the taxing system of Ohio, and would mean the removal of certain personal taxes from other property, and put the taxes exclusively on public service corporations, which means that the telephone, with all its ramifications and enormous property, would come in for double the amount of taxes they are paying, or maybe more. If this bill should pass it would make it impossible for telephone companies, at the present rate for service, to remain in existence. This bill would not relieve the telephone companies from paying the excise tax on the gross income, which they have been paying for some years, and which the telephone companies would continue to pay in addition to the provisions carried in the Howe bill.

I would suggest that you have your directors and ten or fifteen of your active stockholders get together in a meeting and lay this matter before them and ask that each of them call upon the representative or senator representing your county or district. In case they cannot see them personally, have letters written, urging them to use their best efforts towards having the members of the legislature understand the legislative action with reference to any of the bills that would be detrimental or ruinous.

The Hillenkamp bill is of great importance to every telephone company in the state, as we cannot afford to have our property jeopardized by having it placed in the hands of councils of cities, towns and villages to make telephone rates. No state in the Union has as low telephone rates as Ohio. Active competition in every city and town in the state is the best regulator of rates. All of the bills passed are uncalled for and unjust, and every possible effort should be made to defeat them.

It is of the greatest importance that you advise us immediately as to the result of your meeting, and what effect the conference had upon the member or senator in your locality.

We beg to ask you that you advise us as to whom you have seen and what you have done in the matter and report progress from time to time, and let me hear from you frequently. Very truly yours, FRANK L. BEAM,

President Ohio Independent Telephone Association.

### Cook Gets St. Louis.

The order for the complete protector equipment for the new exchange of the Kinloch Telephone Company of St. Louis has been awarded to Frank B. Cook. This is the largest single order for protective apparatus that has ever been placed in this or any other country, as the new Kinloch rack will be the largest single rack in existence. The order calls for 16,000 pairs of protectors, and the type to be furnished by Cook is a brand new one. After months of experimenting and testing of apparatus, Cook's new type was specified. Mr. Cook says it is a radical departure, both in principle and design, from any protector now made, and has a great many particularly good points to recommend it. However, as it will take some time to fill the St. Louis order, he is not ready to enlarge on its merits, or to offer it for sale to other exchanges for some time to come. The order was placed by the Stromberg-Carlson Telephone Manufacturing Co.

The Stromberg-Carlson Telephone Manufacturing Co., Rochester, N. Y., reports having closed contracts for switchboards in the following places: Holton, Kans.; Tonopah, Nev.; Nashville, Tenn.; Elkhart, Ills.; Grand Ridge, Ill.; Bryson City, N. C.; Brantford, Ont., Canada; New York City, N. Y.; Sunset, La.; Mt. Upton, N. Y.; Carthage, Ills.; Central Square, N. Y.; Marcus, Ia.; Franklin, N. C.; Auburn, N. Y.; Ladd, Ills.; Diagonal, Ia.; Lytton, Ia.; Woodstock, Ills.; Rochester, N. Y.; Seattle, Wash.; Fontana, Kans.; Clarksville, Tenn.; New Cambria, Mo.; Cambria, Mo.; Rupert, Ida.; Elkhart, Ills.; Ohio, Ills.

Do it now—subscribe for Sound Waves.

# Big Kansas City Meeting

The annual meeting of the Missouri Independent Telephone Association was held in the Hotel Kupper, at Kansas City, Feb. 22-23. The main object of the meeting was the election of officers and laying of plans for merging all the independent telephone lines in the state.

At the first session J. F. Barnett, the traveling secretary, who has been especially active in the organization of the independents, reported the work he had accomplished in organizing the state into nine districts. He had organized a systematic bureau of information and statistics and had been especially successful in merging competing exchanges and companies. Mr. Barnett was voted the thanks of the association for his efforts in this direction.

The delegates from each district were called upon to express the general sentiment of the telephone men of their district on the subject of the proposed merger and it was found that there was not a particle of opposition. A great deal of time was devoted to the adoption of the constitution and by laws of the new association. The Ohio plan of co-operation was followed very closely.

The property of each exchange or company coming into the merger will be appraised and stock will be issued in the new company to the amount of the ascertained value of each plant.

The by laws were prepared by a committee consisting of J. F. Barnett, F. G. Taggart of Richmond and E. A. Houck of Appleton City.

A committee of finance was appointed consisting of J. C. Leach of Sedalia, M. L. Golliday of Holden and W. H. Bassett of St. Louis.

The Home Telephone Company, of Kansas City, and the Kinlock Company, of St. Louis, will not be members of the new company, but the leaders declare that these companies will co-operate with the new one.

Without opposition the following resolution was adopted:

*"Resolved, That we request all farmers mutual telephone companies throughout the state to incorporate under the laws of the state, and operate in harmony and co-operate with the independent telephone companies in their localities, and become members of this association."*

The resolution was taken to be an expression in favor of a merger just as soon as all the independent lines shall have been incorporated. A committee was appointed to bring about this condition by visiting the owners of the small lines, called "farmer mutuals," and of the larger concerns, and report as soon as possible to the officers of the association. This committee is made up of G. W. Schweer, Windsor, Mo.; James F. Barnett, Rutledge, Mo.; Houch McHenry, Jefferson City; Dr. S. D. Neel, Clinton, Mo.; W. B. Scruggs, Harrisonville, Mo.; Ewing Cockrell, Warrensburg, Mo.; G. H. Rabius, Mayview, Mo.

Arrangements were practically concluded for the merging into two companies of the nine independent concerns composing the Missouri Independent Telephone association. Districts 1, 2, 3 and 4 will be merged into a northern company and districts 5, 6, 7, 8 and 9 into a

southern company. As the northern districts were not fully represented at the convention, James F. Barnett, the traveling secretary, was delegated to visit the stockholders concerned and complete the merger.

The Sixth district, under the chairmanship of G. W. Schweer, met at the Hotel Kupper in caucus and appointed a special committee to complete the merger of the southern concern. The committee consisted of G. W. Schweer, Windsor; D. S. T. Neill, Clinton; Edward Hock, Appleton City; J. F. Barnett, Rutledge, and Houch McHenry, Jefferson City.

"The reason that we have decided to merge the independent concerns into two companies instead of one," said W. B. Scruggs, the president, "is that the Missouri river divides our interests in a rather definite way. We cannot, at present, throw our independent lines across the river and we feel that we will be able to merge the two companies later on. The fight against us by the Bell company seems to have stopped for the present."

These delegates were appointed to attend the national convention of independent telephone companies in St. Louis, next June: J. F. Barnett, Rutledge; W. R. McCanne, St. Louis; C. J. Meyer, Kansas City; H. E. Ralston, Maryville; K. W. Schweer, Windsor. Alternates—M. L. Galladay, Holden; Dr. J. J. Newell, St. Joseph; Houch McHenry, Jefferson City; Ed Foote, Pleasant Hill; F. G. Taggart, Richmond.

Secretary Barnett addressed the convention on "Success of the Independent Movement," and Theodore Gerry of Macon, Mo., read an interesting paper on "Financing Small Telephone Properties."

The election of officers for the coming year means that those chosen will have the management of the affiliated companies. The selection is as follows:

W. B. Scruggs, Harrisonville, president.

H. E. Ralston, Maryville; G. A. Barnes, Hamilton; Houch McHenry, Jefferson City; C. O. Raine, Canton; W. Roy McCanne, St. Louis; G. W. Schweer, Windsor; John W. Sayne, Lamar, and J. E. Dale, West Plains, vice presidents.

Houch McHenry, secretary and treasurer.

Executive committee, W. B. Scruggs, Harrisonville; Theodore Garry, Macon; T. B. Taggart, Richmond; W. H. Bassett, St. Louis.

Committees were also appointed on construction, maintenance, rates, farmers' lines and financing telephone properties.

It is expected that the merger will be completed inside of sixty days.

## Ohio Independent Meeting.

The meeting of the Ohio Independent Association was held at Columbus, Ohio, March 29. The attendance was the largest the association ever had and even though much important business was up for consideration it was all transacted in one day. A big banquet in the evening wound up the meeting. An extensive account of this important gathering will be given in our next issue.

### Iowa Independent Association Meets.

The meeting of the Iowa Independent Telephone Association held at Des Moines, Iowa, March 13, 14 and 15, too late for our April issue to give an extended write-up was one of importance to the independents. It was largely attended, not only by those belonging to the association, but by people from over the country who are in sympathy with the movement and who are interested otherwise. Its purpose, besides being a regular gathering of its members and others was to make the association larger and stronger and to throw out an influence if possible that will bring into the fold every company not now connected with the organization and thus make stronger the power with which to fight the Bell.

The session was held in the Chamberland Hotel and the following excellent program was carried out:  
Presidents Address.

Report from District Organization.

"The Best Method of Handling Subscribers' Toll Accounts," by H. A. Douglas, Cedar Rapids.

"Better Long Distance Connections," by C. H. Smith, Sioux City.

"The Clearing House," by George T. Hewes, Des Moines.

"Our Friend, the Farmer," by Dr. Nelson, Dayton.

"Care and Maintenance of Equipment," by R. A. Walker, Iowa Falls.

"Managers' Experiences," by G. T. Everett, Columbus, Neb.

"Our Needs in Iowa," by E. E. England, Mt. Pleasant.

"District Organization," by Chas. C. Deering, Boone.

"Toll Service," by Geo. N. Bandy, Des Moines.

"A Press Bureau," by Geo. E. Atkinson.

"Tactics of the Opposition," by J. H. Shoemaker, Waterloo.

### Meeting in Oklahoma and Indian Territory.

The Oklahoma and Indian Territory Independent Telephone Association held its semi-annual meeting in the parlors of the Lee Hotel at Oklahoma City, Feb. 12. The meeting was called to order by Pres. W. J. Steele.

Roll call was responded to by the following: W. J. Steele, Kingfisher, Okla.; J. C. Harrell, Cordell, Okla.; G. F. Patterson, Elk City, Okla.; E. S. Moody, Oklene, Okla.; J. W. Adair, Sayre, Okla.; L. T. Hine, Purcell, I. T.; E. Herring, Eagle City, Okla.; J. W. Wilson, Okla. City, Okla.; W. B. Roberts, Cincinnati, Ohio; F. W. Mackey, Saint Joseph, Mo.; W. N. Hayes, Norman, Okla.; H. A. Nuttall, Chicago, Ill.; W. G. Brymer, Bradley, I. T.; W. H. Baker, Weatherford, Okla.; J. F. Beydechick, El Reno, Okla.; J. A. Mead, Elk City, Okla.; L. J. Hunt, El Reno, Okla.; E. E. Westervelt, Okla. City, Okla.; E. D. Nims, John M. Noble, E. W. Adams, P. R. Higgins, of Okla. City, Okla.; J. F. Merri-man, Morrison, Okla.; J. P. Woolsey, Morrison, Okla.; T. Knersley, Glencoe, Okla.; C. W. Floyd, Tecumseh, Okla.; Dunbar, St. Louis, Mo.; G. F. Hardwicke, Muskogee, I. T.

Many topics were discussed but the principal one was; "How to Handle the Farmers' Lines Successfully." An interesting speech was made by E. D. Nims, with reference to the good feeling between all companies, both in Oklahoma and Indian Territory. The good will toward companies there, is said to be far above the average of any section of the United States.

It was decided by the convention to have the secretary send out circulars to gather data, with reference to farmers' lines, also to secure the number of telephones, rates, population, area of city, and character of construction of work of all towns both in Oklahoma and Indian Territory.

The result of the election of officers is as follows:

H. Freeman, Pres.; E. S. Moody, Vice Pres.; L. T. Hine, Sec. and Treas.

E. E. Westervelt, F. H. Wright, J. A. Mood, W. J. Steele, Executive Committee.

### A New Cross Arm Support.

A new device is on the market which will undoubtedly appeal to all those interested in telephone line construction. Its name implies its purpose and from the description its advantages are apparent. The article is a steel gain and is manufactured by the Steel Gain Manufacturing Co., a corporation recently organized in Chicago. The present offices of the company are at 14 S. Clinton street and the management is under the direct supervision of Kempsted B. Miller, president; Walter H. Trimm, secretary and Ernest E. Yaxley, treasurer.

While improvements have been made in telephone apparatus, the old methods of construction are still largely used. It is an acknowledged fact that a gain cut in a telephone pole is a detriment to the pole for several reasons. In the first place, a cut gain weakens the pole at the very beginning and tends to cause further weakness during the life of the pole. By exposing the end grain of the wood at each gain, the best possible opportunity for rot to occur is afforded; consequently, many poles become absolutely worthless simply because of the excessive rot at the gains. Furthermore the portion of wood removed when cutting a gain is, of course, at the outside of the pole which is the strongest part of any piece of wood. The use of the steel gain eliminates this fault.

This new steel gain consists of two pieces; a carved steel plate adapted to embrace the pole and a steel gain provided with projecting braces or tongues which pass through apertures in the pole plate. Shoulders on these braces clamp against the pole plate and afford a rigid support for the gain. The ends of these braces passing through the pole plate engage the pole and supply a further support to the whole structure. The pole plate normally has a greater radius than the largest pole top and when drawn into place not only conforms closely to the circumference of the pole, but draws down against the gain thus providing sufficient spring tension to compensate any shrinkage in the pole or cross arm. The gain itself is of such length and supports the arm to such a degree that it renders it unnecessary to use cross arm braces on four or six pin arms.

To attach a cross arm, it is simply necessary to clamp it in place with the gain by means of a through bolt. The relation of the gain to the pole plate is such that the arm is brought into perfect alignment without the use of a square.

The gain is made throughout of heavy Bessemer steel and can be furnished either plain or galvanized at a price not exceeding the cost of a cut gain.

In summing up the advantages derived from this steel gain, the manufacturers give the facts in a few short statements. The steel gain can be bought for the same amount or even less than it costs to cut a gain in a pole. It affords a much stronger means of attachment for the cross arm. It entirely eliminates the necessity of having cross arm braces on four or six pin arms. It facilitates the placing and alignment of cross arms. It strengthens the pole instead of weakening it. It prevents rot and trouble from frost and ice. It saves an enormous amount in gains that are cut and never used. It can be placed on a standing pole easily and quickly. It provides a means of mounting new cross arms on old poles having rotted gains. It makes a five inch top as strong as a six inch top with a cut gain. It is an improvement which is practical, cheap and valuable to every man building telephone, telegraph or electric light lines.

The steel gain above described is not an experiment, it having been in use for fifteen or eighteen months. Several of the largest pole line companies in the northwest have adopted it for all of their pole line work. They find that all of the claims of the manufacturers are well founded and that the lasting qualities of the gains is a big feature in its favor.

An illustrated folder fully describing the steel gain and setting forth its advantages in detail is ready for distribution and will be mailed to any one making inquiry for same. The gains may be purchased from any of the supply houses or direct from the Steel Gain Manufacturing Co., 14 So. Clinton Street, Chicago.

A new telephone line will be constructed between Quincy and Melrose, Illinois. The promoters are Henry Bockhold and others.

# The Future of the Telephone

JAMES B. HODGE

Considering that so much has been written and said about the Independent telephone situation, past and present, I think we are safe in asserting that fifty per cent of the citizens of the United States at least realize the importance of the telephone, and that the greater part of this number appreciate the fact that the telephone which was put on a commercial basis and popularized by the Independent companies is as essential in carrying on the business and administering to the comforts and social wants of civilized communities as any of the other public utilities now commonly recognized as indispensable.

The discussion of the subject assigned to me, dealing with the future of Independent Telephony, cannot fail to be of interest to every stockholder and employe of those companies at present comprising the movement. In handling this subject, I shall endeavor as briefly as possible to point out along a few lines what I consider the probable future of the business in which we are engaged. In doing this, I have no desire to pose as a prophet. We can only anticipate the future by a careful study of the past, and a close observance of present tendencies. Let us then, with a view of gaining an insight into this probable future of Independent Telephony take a brief review of its past.

The first thing that attracts our attention is its unprecedented growth. Comparatively only a few years ago the telephone was considered in much the same light as the automobile today. Its cost was prohibitive for any but the well to do and its utility was questioned by most of those who could afford it. For the residence it was looked upon as a luxury or a rather costly plaything; and in business, while recognized as a valuable aid, perhaps, it was by no means considered necessary. Contrast this with the present condition. Its reduced cost has now brought it within the reach of people with only moderate means, and its usefulness and convenience in social affairs, and its indispensability to the business world have been demonstrated beyond doubt. The question of the up-to-date business man is no "Shall I have a telephone," but, "How many telephones must I have?" and in the residence where it has once been adopted it is considered as indispensable as a sewing machine, a modern clock, or any of the present household necessities, which were once, perhaps, regarded as luxuries.

Eleven years ago there was one telephone to every 225 people in this country; now there is one to every 16. Although the Independent companies are not furnishing all of these additional telephones, the increase is directly due to their entering the telephone field.

While the growth of the future, taking the number of telephones installed in proportion to the people in the country may not be as great as that of the past, numerically considered, I think it will be much greater and far in excess of the increase in population. Along what lines this growth take place? In my opinion, it will be in residences and small retail establishments in our cities and towns, and among the dwellers of the rural districts that it will be most noticeable. Practically all business places worthy the name are now equipped with telephones, and the growth there will be more in the nature of extension

through the installation of private branches exchanges connecting all departments.

I have estimated that a little less than fifty per cent of the people of this country appreciate the advantages of the telephone; yet my estimate is considered too high by many who say that not more than one-third of the inhabitants of this country really know about the telephone, and that a large percentage of these are not at all familiar with its advantages. In defense of their argument they call attention to the fact that the ratio of telephones in use to the number of people in the country is only one to sixteen, while, they assert, the country will easily support one telephone to every five people. In some localities this is the ratio at present, and in my opinion the country could stand as great a general development.

I think I am not over sanguine in saying that at the end of the next decade, the comfortable home that is not equipped with the telephone will be an exception to the rule. People of moderate means, both in the cities and in the country, will have them installed in their homes, and landlords will equip the places which they have to rent with telephones, just as the modern flats and terraces of today have refrigerators and steam heating plants installed, and are equipped with gas stoves and electric light.

So far, we have considered only the increase in local use. The long distant development, to my mind, will be just as great. The service between neighboring towns and villages will be brought to a very high order, and the interstate and transcontinental business will be developed to an extent scarcely dreamed of today. Independent through lines will connect all of the large centers of population, and the congested condition now so prevalent in many places on short hauls will be relieved by increased circuits and better facilities for handling the service between local points, and forwarding it to the large centers for delivery to the through lines. The class of service will be greatly improved, and the transmission on even the longest hauls will not be inferior to that of the best local exchange. The long distance telephone is destined to cover a much larger field than at present. It will not take the place of telegraph, but will continue to develop new business for itself that does not today exist. It is now being quite generally adopted by the railroads in conjunction with their present telegraph systems, and is being used almost exclusively by the inter-urban traction systems of the country.

We now come to the question of future equipment, which is a most important one from a financial point. Many of the best engineers of the country feel that equipment will be designed so as to permit of greater economies in operating and maintenance. This will probably be accomplished through a combination of the manual and automatic systems, or what might be called the semi-automatic. The wires that have heretofore been taking care of one subscriber or one toll message at a time will be made to provide greater service than is now being obtained. It has already been found possible by combining the telephone and telegraph, to telephone over one pair of wires and at the same time sending telegraph messages over the same circuit. The railway companies



have made it possible to haul a less amount of fuel and with the same number of men over a given place of tract five times the freight tonnage it was possible to haul fifteen years ago. This has been accomplished by cutting down grades, straightening tracts, and through the use of improved equipment. There is no reason to doubt that still farther economies in telephone apparatus will be worked out in the next few years.

The method of charging for the telephone in the future will undoubtedly be that of measured service. All of the other public serving corporations have been compelled to abandon the flat rate plan of making charges and adopted a unit of measure basis. Over sixty per cent of the patrons of the public serving corporations think this is the only just way of making charge for any commodity furnished, and they object to paying more than their share of the cost of such commodities where less than forty per cent reap the benefit. In other words, the flat rate induces every one to be more or less extravagant in the use of the commodity. The forty per cent that are compelled to use abnormal quantities of water, electricity, gas or telephone service would undoubtedly prefer a flat rate as long as possible, but the sixty per cent that can get along with a reasonable amount of service will demand a fair charge on a measured basis for the commodity furnished them. The most striking illustration of this is the fact that practically all of the municipalities owning their own water works have already gone on a measured basis, or are seriously considering the matter of installing meters, and where they have been installed for a few months, so as to give the citizens an opportunity of trying them out, they have been found to give very general satisfaction. The installation of proper meters or measuring devices entails a large expense on all of the public serving corporations, and yet it benefits them for the reason that it cuts down waste that cannot help but be costly to these companies. The meter system for telephone companies will be different in some respect from those in use by water, electric light and gas companies. It will be based on a minimum charge which will entitle the subscriber to a limited number of calls; all over that number to be paid for at a fixed rate per call. This will insure a sufficient revenue from each instrument to cover the cost of maintenance and fixed charges on installation expenses. The minimum charge and rate for additional calls will vary in different localities to suit local conditions. The adoption of this system will be an advantage to both the public and the telephone companies. It will correct many of the abuses to which the telephone is now subjected by many of the best meaning subscribers. Where the telephone is paid for according to the number of calls its use will be limited to necessary personal and social calls, and frivolous conversations will be largely eliminated. It will also have a tendency to do away with telephone borrowing, so-called. This is one of the most serious abuses of the telephone today. It not only annoys the subscribers to have non-subscribers ask for the use of their telephone, but it also ties up their lines so that important calls for them must be refused on the ground that their lines are busy. At present telephone companies are furnishing this service to non-subscribers gratis, which is not fair to invested capital. There are few among those who recognize the importance of the telephone who are not inclined at times to look upon it in the light of a necessary nuisance for the reason that a large percentage to subscribers do not appreciate the importance of exercising judgment in the use of the telephone, but

call up at every unseasonable times and on every trivial pretext. An extreme case came to my notice a few days ago. A gentleman had been bothered a great deal by his wife and daughters calling him up several times during the day to inquire whether he mailed their letters, and making various other nonsensical inquiries too numerous to mention. At last, in desperation he secured an injunction preventing them from calling him up at his office. This is, of course, an unusual case, but illustrates my point, and many similar instances showing the ridiculous abuse of the telephone might be cited.

The meter system applies to telephony, by putting the social use of the telephone on a business basis and eliminating other abuses which at present exist, will do much to increase the popularity of the instrument, and will at the same time have a great tendency to increase the number used by making it necessary for those who would enjoy the benefits of the telephone to install one of their own.

[Delivered at the meeting of West Virginia Independent Telephone Association, Parkersburg, W. Va.]

### Northeastern Iowa Independents Meet.

Representatives of the Northeastern Iowa Independent Telephone Association held a meeting at Vinton, Tuesday, Feb. 13. This association is one of the largest in the state of Iowa, being composed of the leading Mutual and Independent Companies operating in about twenty-five counties in Northeastern Iowa. There are about 25,000 town and farm telephones in the vicinity covered by this association and the meeting was of considerable importance to its representatives. Its purpose was to give all the problems of the business a discussion and to take such steps as were necessary at the time to further protect the interests of the Mutual and Independents. Several good papers were read which are reserved for future publication. The following program was carried out:

"The City Manager and the Farmer"—H. A. Douglas, of Cedar Rapids.

"The Farmer and the City Exchange"—C. A. Hollis, of Hudson.

"Four-Party Lines"—J. A. Gustafson, of Vinton.

"Toll Lines and What They Mean to Us"—R. A. Walker, of Iowa Falls.

"Some Experiences"—J. H. Shoemaker, of Waterloo.

The new owners of the Indianapolis Telephone Company, of Indianapolis, Ind., and the Long Distance Telephone Company will now improve and develop the two systems. C. E. Stinson has been appointed consulting engineer.

The Mt. Auburn Telephone Company of Mt. Auburn, Iowa, has elected the following officers: President, John St. Clair; vice-president, L. C. York; treasurer, W. H. Tracy.

The Madison County Telephone Company, of Macksburg, Iowa, has been organized with a capital stock of \$25,000, by W. N. Smoot and others.

The toll lines of the Interstate Telephone Company extending from Dysonville to Hopkinton, Delhi, Delaware and Manchester, Iowa, have been taken over by the Delaware County Telephone Company of Manchester, Iowa.

# Some Ideas of Telephone Currents

G. W. WILDER

In general there are four kinds of currents used in telephone work. They are known as Direct, Alternating, Interrupted and Fluctuating. The relation of these four currents to each other are very interesting, although the rank and file of telephone men are not accurately acquainted with them. In order to fully appreciate the operation of any telephone circuit it is not only necessary to know something of the manner in which these currents behave with regard to each other, but also to know the effect of different kinds of apparatus upon them. For the purpose of developing a few ideas in this connection we will try to define each of these currents and then point out their most salient features.

A Direct current is the most commonly known current used in all kinds of electrical work. It is produced by batteries and in any given circuit is constant in value after the circuit has once been closed. Suppose a simple circuit to be set up consisting of a dry cell, key and wire resistance as shown in Fig. 1. After closing the key a current will flow through the circuit, the value of which will depend upon the resistance of the wire and the electromotive force of the

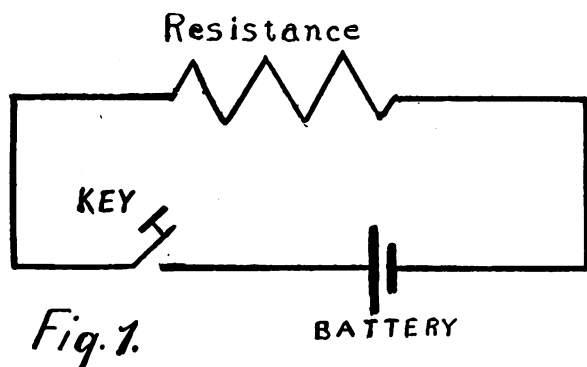


Fig. 1.

battery. This current at first increases in value from zero at the instant at which the key is closed until it reaches a full value indicated by Ohm's law and depending upon the quantities just mentioned. The time it takes for the current to reach this maximum value is very short, probably less than a thousandth of a second in the majority of cases, hence it is customary to neglect this time interval and to assume that the current reaches its steady value instantly after closing the key.

The current in a case like this one will remain constant in value providing no changes occur. Sometimes the resistance becomes heated, owing to the current being too large for it, or the battery may become polarized if it is giving off too much current and in either case this will alter the current flowing through the circuit and hence lower its value. Considering that the wire does not become heated, nor the battery polarized, or that any other changes occur, the current will remain constant and will always have the same value at any instant. Such a current may be represented by a curve as drawn in Fig. 2., in which values of current are laid off on the vertical line while values of time are

placed on the horizontal line. Since the current remains constant in value it is represented by a straight line.

It should be remembered that our notion of a current flowing through a circuit is at best a very crude

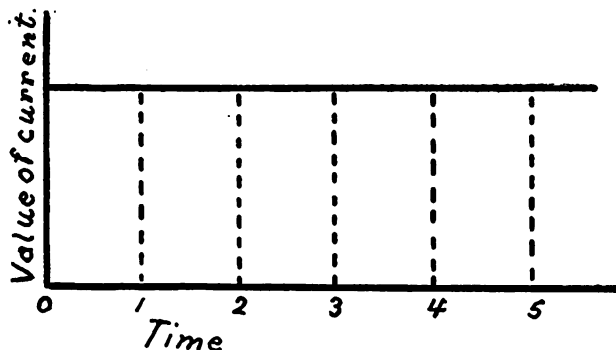


Fig. 2 Direct Current Curve.

one, owing to the fact that we do not know what electricity is. We have not the slightest idea of what is going on in the circuit as far as the flowing of anything is concerned. We know that nothing material flows and all that is really transported is Energy and how that is carried no one can tell. We do know, however, many of the laws governing the transportation of this energy and are able to use them in working out every day problems. We know, for instance, that the rate at which energy is transported depends upon the size and material of the conductor as well as its temperature; also upon the electromotive force of the battery used.

In order to further account for electrical phenomena we use imaginary conceptions of what is going on in the circuit. Many of us think of the transportation of the energy as being like the flow of water through a pipe. This is the popular idea and is founded upon the experimental fact that a compass needle placed near a wire carrying a current is differently affected when the wires attached to the battery are interchanged. This shows that there is a definite relation existing between the direction of the magnetic field produced by the current and the way in which the wires are connected with the battery. If it be assumed that a current flows through the wire like water flows through a pipe, then it is necessary to decide what the direction of flow shall be. In this way it was agreed to make the direction as being from the copper or carbon, to the zinc, through the wire. This has always been the convention used since the early days of electricity, although as we see, there is no reason, as far as real theory is concerned, why one should not say that the current flows in the opposite direction, since we do not know that it flows at all, the idea being merely a work of the imagination.

It is to be remembered, then, that a direct current has not only magnitude but also direction, and in telephone work it is often necessary to distinguish between the two directions in which the current may

flow. This is especially important in four-party line work where a system of selective systems is used. In such cases the directions are designated by calling one Positive and the other Negative. In speaking of a direct current then we will think of something flowing out from the positive pole of the battery around to the negative pole, not unlike the flow of water in a closed canal. In fact the idea of a closed canal is often used for this purpose and is a good one when applied to simple electrical phenomena. Imagine such a canal as shown by Fig. 3, in which the battery is represented by a water wheel. The turning of the wheel represents the power given up by the battery and the flow

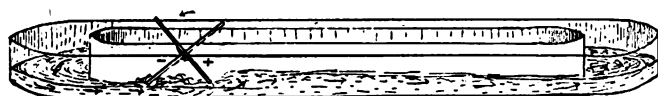


Fig. 3. Canal and Water Wheel Representing A Direct Current.

of the water takes the place of the current. On the positive side of the wheel the water is raised to a higher level and falls gradually on its way back to the negative side, where it is again raised and the process repeated. The flow of the current is imagined to be regular and smooth. The surface of the water being unbroken by any ripples or otherwise disturbed.

Such a current is the kind that flows in the battery circuit of a magneto telephone when the instrument is ready to be talked into. The same kind of current also flows over the wires of a common battery system to energize the apparatus. In the latter case it is supplied by batteries located at the exchange, while in the former case each subscriber's instrument has its own battery. The current is not normally flowing through the instrument, but is switched on by the simple act of the subscriber lifting the receiver from the hook. Dry cells and storage batteries are the best sources of the direct current and practically the only sources at present. Attempts have been made to use machines for generating this current, but for telephonic purposes these have been unsuccessful, although for other kinds of work, such as lighting and power, where great quantities of current are used, they are all that could be desired.

An interrupted current is one in which the circuit is repeatedly made and broken or the current alternately turned on and off. This may be done by working a simple key, such as is shown in Fig. 1., or it may be performed by an automatic device, called an interrupter. The operation of a telephone instrument is an illustration of the former; the device that operates a spark coil, such as used in X-ray work or the coil that ignites the gasoline of a motor car, are examples of the latter. In the former case the interruptions do not occur with regularity as in the latter case, but this does not alter the character of the current.

The form of an interrupted current is shown in Fig. 4. It will be noticed that at one instance the value is zero while at another instant it is a maximum. Strictly speaking the current does not rise to its maximum nor does it decrease to zero instantaneously, but occupies a little time in doing so. This is because a current builds up a magnetic field around the conductor through which it is flowing. This field represents an expenditure of energy and hence robs the current of

some of its value while the process of building up goes on. The amount of energy contained in the field depends upon the strength of the current, so that we see

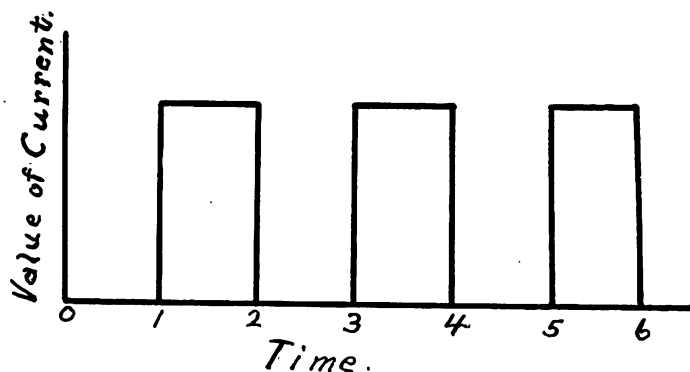


Fig. 4—Interrupted Current Curve.

that as the current increases the energy stored up in the field increases and this tends to delay the building up of the current. The magnetic field acts then as a sort of a drag upon the building up of the current and this dragging effect will naturally depend upon how much magnetism is required to satisfy the conditions of the circuit. For a straight conductor the magnetic field built up will be rather feeble and the current in this case will rise to its maximum value almost instantaneously. If we wrap the conductor around a piece of soft iron, however, then the current will magnetize the iron and we will have a much larger amount of magnetism for any given value of current than we would were the iron not present. In such a case it will take more energy to build up the magnetic field and consequently the drag on the current will be much larger and the time necessary for the current to reach a maximum value will be much longer. This will give a cur-

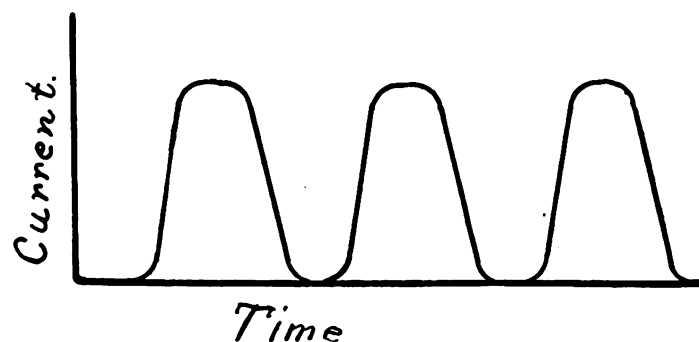


Fig. 5—Curve Showing Effect of Magnetism.

rent curve which will be more sloping as shown in Fig. 5, in which the rise is more gradual. If a circuit contains several electromagnets with iron cores it may be that a large amount of energy will be stored up in the magnetism of these magnets. The current curve in such a case would be even much more current than in the above case.

(To be continued.)

The Yonkers Specialty Company, manufacturers of telephone specialties, is sending the trade a very attractive catalogue, pocket size. It includes price lists and descriptions of the New York Wire Connector, the Metropolitan Cable Clips, types A and B; the New York Ground Clamps and Metropolitan Expansion Plug.



## The Man on the Road

As The Man on the Road came into the manager's office and tried to look as if he wasn't married, so that he might make a hit with the operators, the Exchange Manager looked up from the latest reports of the Canadian lottery, over which he was looking in a vain attempt to find the number of his ticket among the winners, and said:

"Hello, just get in town?" "Sure," answered The Man on the Road. "Just came in on the 'Peanut' a trifle late this morning, because we run into a farmer's line that had forty-two instruments on and the load was so great that the wires sagged down to within ten feet of the track."

"Oh, you needn't get sarcastic the minute you land," said the manager, feeling his sore spot touched, as he had the reputation of loading his lines to the limit; "and I think you have your weak points yourself, this morning I was reading an article in the Electrical Review of 1887, and it described a test you told me about on your last trip. Where do you get your wisdom, or do you lie awake nights and think out stuff that was put in print long before you tasted your first high ball."

"Well, to be real confidential," replied The Man on the Road, "I just beg, borrow and steal from everybody and every publication on earth, and once in a great while, when I have an unusually bright spell, evolve something out of my own gray matter, so if you or anyone else sees anything with my name attached and think you could use a little glory, just claim it and I won't kick a particle."

"But never mind where I steal my thunder, the question is, what do you want today, and how much of it? There is nothing new out since my last trip but we still have the same old quality. Furthermore, I want to get out on the 3:42, and if you get me to talking, as you usually do, I won't get out until tomorrow."

"Au ferget it and hide that order book for awhile, anyhow, I don't want anything this time. I am going to buy from from the Cut Price Company after this because their stuff sells reasonable and they don't hold a man up like you folks do," said the manager; "and, by the way, how did you find the situation down east? You were down there recently, wasn't you?"

"Yes, I took a little trip down through Pennsylvania, Maryland and West Virginia for a change and found the Bell were in pretty bad shape in Pennsylvania. In one place I struck they are making a business rate of \$6 per year and a residence rate of \$4, and having hard sledding at that."

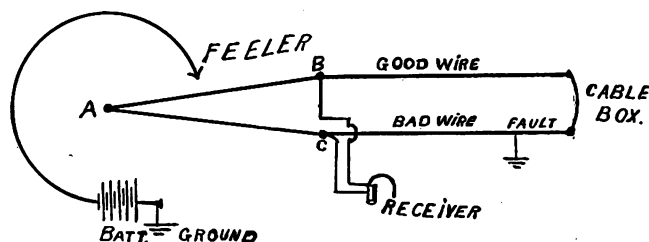
"I took a little run over to Washington, D. C., and had a nice, long chat with the general manager of the C. & P. Telephone Company there, which is Bell, and he told me in all confidence that the Bell were going to spend four millions in Pennsylvania this year and literally wipe the opposition companies off the earth."

"He further said that the Bell Company didn't give a cuss whether they made any money or not so long

as they put in instruments and increased their subscribers lists, and I told him I believed it from the number of instruments they were putting in three months free and the nickle pay stations without a guarantee. Then, from the number of independent cables that are shot at and hit around the country it looks as if the Bell Company was not slinging mud, but lead."

"By jiminy, I'm glad you mentioned that," exclaimed the Exchange Manager, "because I have a case of cable trouble on hand now and my Wheatstone Bridge is out of commission. How can I locate the fault?"

Well," replied The Man on the Road, drawing closer to the desk and taking a piece of note paper, upon which the manager had been writing to another man's wife, "we will ring up a little deal here that will give you, I believe, as close results as your Bridge and won't cost so much by a long shot, either."



"All we will need is a couple of binding posts, some german silver wire, a receiver and battery.

"At B. and C. we will place the binding posts and run a german silver wire from B to A to C. For convenience sake we will have A 500.8 of an inch from B and C or 5.2½, giving us 500 spaces on each side.

"There we connect a receiver across B and C. Connect a good wire in the cable to B and the bad wire to C. Shore circuit these wires at the cable box.

Now, inasmuch as A is the electrical center of B A C, and the cable box the electrical center of B cable box C, a thousandth part of one will be equal to a thousandth part of the other.

With feeler F feel along A B until you strike a point at which you get no click in the receiver. This we call the neutral or point of equal potential.

Now, measure spaces from A to neutral point and call same S.

Length of cable in feet we will call L.

The distance from the cable box to the fault we will denote by D. Then we have

$$\frac{L \times 2}{1000} \times S = D$$

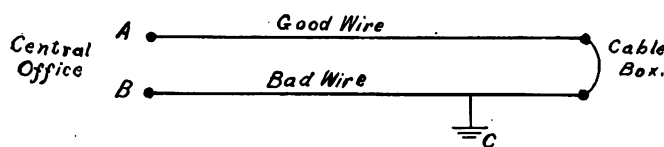
"For example. Your cable is 2,500 feet long. That gives us a circuit from B to the cable box and back to C of 5,000 feet. We have 500 spaces on each side of our slide wire. We find the neutral point 320 spaces from A. Then we have

$$\frac{2500 \times 2}{1000} \times 320 = 1600 \text{ ft.}$$

which is the distance from the cable-box to the fault.

"This test, providing you have a good wire for test and you know the length of your cable is quite accurate. However, if you are not positive as to the length of your cable another way would be to take the resistance in the following manner:





$$\begin{aligned}
 &\text{Take resistance } AB=R \\
 &\text{" " } AC=R' \\
 &\text{" " } BC=R'' \\
 &\text{B to fault } = X \text{ ohms.} \\
 &R'' - \frac{R' + R'' - R}{2} = X \text{ ohms.}
 \end{aligned}$$

"This test takes into consideration the resistance of the fault itself, and, therefore, gives you an accurate reading from B to the fault."

"Yes, I see all that all right," said the Exchange Manager, "but on that resistance deal how are you going to remember how much the resistance of wire is when it runs in 36 different sizes?"

"It really is a very simple matter," laughingly replied The Man on the Road, "when you stop to consider that a wire which is three sizes larger than another wire has  $\frac{1}{2}$  the resistance, twice the weight and twice the area. However, for your edification and instruction I will give you an approximate table of the resistance per 1,000 feet of copper wire of different sizes, which you may paste in your hat:

Size.	Ohms.	Size.	Ohms.	Size	Ohms
0	.1	10	1.	20	10.
1	.125	11	1.25	21	12.5
2	.16	12	1.6	22	16.
3	.2	13	2.	23	20.
4	.25	14	2.5	24	25.
5	.32	15	3.2	25	32.
6	.4	16	4.	26	40.
7	.5	17	5.	27	50.
8	.63	18	6.3	28	63.
9	.8	19	8.	29	80.

Well, it does beat all how much you fellows on the road can remember," admiringly exclaimed the Exchange Manager, "and, now, on second thought, I won't turn you down without ordering something; you can send me a hundred half ampere fuses. How much are they?"

"Dollar and a quarter," answers the Man on the Road wearily, as he reaches for his order book and thinks of his  $2\frac{1}{2}$  per cent. commission. "What railroad do you wish them shipped over?"

"Oh, just mail them," replies the Exchange Manager, purely unconscious of the sarcasm, "glad you dropped in, stop off whenever you get around this way, always glad to see you."

And as the Man on the Road settles himself in the smoking car on the 3:42 he figures on the back of an envelope something like this:

Fare to town .....	\$1.40
Dinner .....	.50
Cigars .....	.25
Shave and shine .....	.25
Fare from town .....	.87
<b>Total expenses .....</b>	<b>\$3.27</b>
<b>Total business .....</b>	<b>1.25</b>
<b>Shortage .....</b>	<b>\$2.02</b>

And in an undertone he may be heard saying, "To say nothing of the information I spilled around, too. Well, I guess the swindle sheet works overtime this week all right."

#### NATIONAL INTERSTATE TELEPHONE ASSOCIATION.

General Headquarters, Cleveland, Ohio.

#### OFFICIAL BULLETIN NUMBER EIGHT.

##### MAPS.

We have begun toll line maps for Nebraska, Kansas, Kentucky and Minnesota, making thirteen States to date for which maps are being prepared.

If you have not already done so—please send us that map of your lines.

##### COMMITTEES.

The following Committees have been appointed. Communications in regard to the work they will take up are invited and can be addressed to the chairmen of the respective committees in care of this office.

##### STANDARD FORMS OF ACCOUNTING.

Chas. F. Bender, Chairman, Pittsburg, Pa.  
C. J. Myers, Kansas City, Mo.  
Geo. T. Hewes, Des Moines, Ia.  
R. E. Mattison, Lincoln, Neb.  
H. W. Spooner, Minneapolis, Minn.

##### STANDARDIZATION OF EQUIPMENT

M. H. Clapp, Chairman, St. Louis, Mo.  
W. C. Polk, Birmingham, Ala.  
Edmund Land, Grand Rapids, Mich.  
O. F. French, Cleveland, Ohio.  
J. W. Kelly, Jr., Philadelphia, Pa.

##### STANDARD OPERATING RULES AND REGULATIONS

J. B. Casey, Chairman, St. Louis, Mo.  
W. D. Handlan, Wheeling, W. Va.  
L. R. Herrick, Freeport, Ill.

##### STATISTICS WANTED.

We should like to hear from the companies operating rural telephone systems in regard to the increased value of real estate in country districts due to the introduction of the telephone. It is commonly recognized fact that such increase in value invariably follows the completion of rural telephone lines, and we think the compilation and publication of statistics with reference to this, will be of interest and value to all Independent operators.

##### SUPPLY DEPARTMENT.

Judge by results, the Independent telephone people appreciate the efforts of this department to thoroughly introduce the "Official Shield." Just now, we are making a special endeavor to have all Independent companies who are not at present doing so, display the standard toll sign at exchanges and toll stations. Will you co-operate by seeing that your company gives us the proper support?

Illustrated catalog on request.

A. L. Tetu, secretary of the National Interstate Telephone Association, has been appointed acting general manager of the Indianapolis Telephone Company and the new Long Distance Telephone Company of Indiana. Mr. Tetu still retains the general management of the Nashville (Tenn.) Home Telephone Company.

# The Exchange as it Should Be

BY C. J. NEWTON

The ideal Telephone Exchange is one that connects with every business place and residence in the town or city where it is installed. Such an exchange not only guarantees that each subscriber will be able to derive the greatest benefit from the telephone, but if properly constructed and managed guarantees a financial success for the company operating it.

While many may say that it is impossible to attain this much-to-be desired condition, still a careful study of the situation in most localities will do much to justify the construction of a system that will provide facilities to carry out this plan.

Any company that gives good service will find its business constantly increasing, and if the construction as first laid out is soon filled up, it means that extra work and expense is necessary, these extra enlargements generally costing more in proportion than when the first work is done.

Looking at the matter from a financial point, it is cheaper in the end to provide facilities for every store and residence if modern construction methods are followed. True, the first cost is no doubt more, but the final cost will be found to be less and most certainly the work and appearance will be much better and present a uniform method of construction.

The several following reasons justify this method of construction: Better prices can be had in buying material in quantities; Freight charges can be lessened by shipping in carload lots, and when the construction is completed a very small gang can run the wires from the distributing poles to buildings and can do the work quickly, and the difference in price between cables of different sizes is so small that it is better to use a size that will be sure to be sufficient than to later have to add other cables in order to provide for growth.

Except in large cities, a complete underground system is not demanded, but there are many places where it would be to the interest of the company to put in underground in place of aerial cable and certainly the property owners will be better satisfied. An underground system properly built is worth all its costs and generally increases in value, whereas the very best aerial construction is open to damage and is sure to depreciate.

Where conduit is laid under asphalt, brick or block pavement, be sure you lay sufficient ducts for the expense of taking up and relaying, as this will add greatly to any enlargement of the duct capacity; besides there is generally a chance to rent some ducts to other companies.

Conditions in various towns are so different that no fixed rules can be made that will apply to every place, but each place will need careful study. Generally, the terms of the franchise will specify in what section of the town the wires must go under ground, but it is out of this district that judgment is required in choosing the best method of reaching all points.

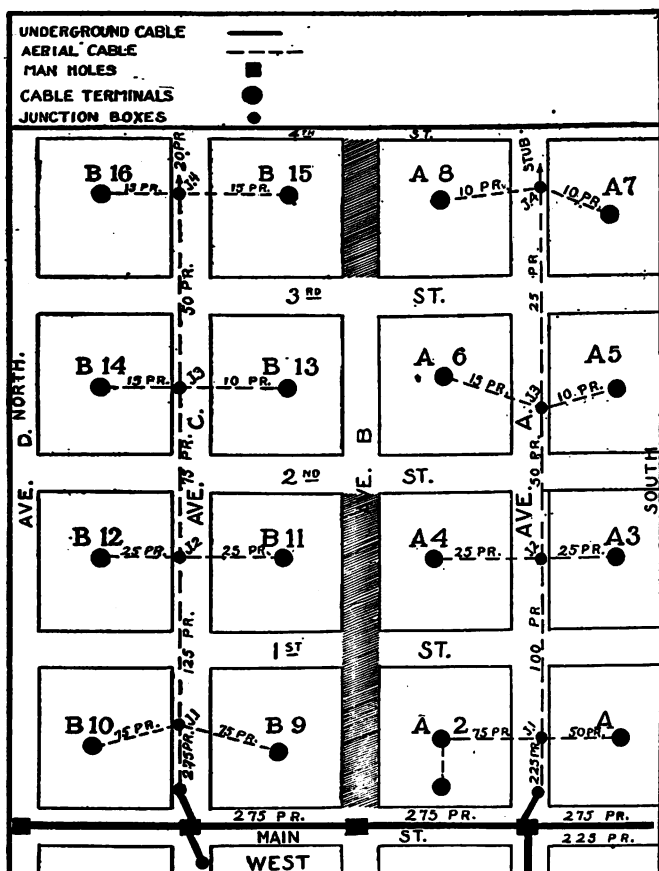
The Engineer should remember that he must strive to please the people of the town as well as the officers of the company, for on the support of the citizens will depend the success of the company. Poles are objectionable to most every property owner and certainly crossarms and open wire is not to be considered except in the outskirts of the town.

The most suitable method to be employed is a gener-

ous amount of underground work with the balance aerial cable, having frequent distribution points. If the cable terminals can be located in the center of the blocks, the wires can lead to the rear of the buildings and will give better satisfaction.

Assume, then, that we are to lay out a system to provide facilities for every store and residence in the town, using both underground and aerial cables with block distribution as much as possible.

The first thing necessary is a good map of the place, and generally it will be found necessary to take a small map and enlarge it and make a tracing from which prints can be made. Having the map completed, the next thing is to mark on it the kind of pavement in each street, (this can be done by using different colors for asphalt, brick, block, macadam or dirt pavement) as a thorough knowledge of these conditions will enable the engineer to save considerable money. Each block is then to be numbered and a careful canvass of the town made to get a record of the number of business places, private residences and families in each block; this information is to be marked on the map.



Then mark where the underground has to go according to the franchise and from this plan you can lay out any additional underground or the aerial routes. In places where there are alleys the construction can be easily done, but unfortunately, alleys are very rare in some towns. There are two plans that can be followed in this distribution; first, cable can be run up each street, having cable boxes at frequent intervals; second, cable can be run up

every alternate street and at or near the center of each block taps can be run into the middle of the block to a distributing pole; this latter method is better and cheaper, but there is frequently trouble in getting permission for aerial cable over private property, but where the poles on the street are set on the property line and the block cable runs over the fence line to a pole in the rear, it may be done.

In any case the method of entering each block must be decided on and the necessary permission secured before you can decide on your cable lay-out. Time spent in settling these points, first, will be amply repaid in the trouble avoided later on; this is the time that the services of a competent right-of-way man will be appreciated.

Where it is impossible to take a block cable in, aerial, it may be possible to go in underground or even through a cellar, having decided on the street most suitable to go up, every effort should be made to enter the blocks in some manner acceptable to the property owners.

After each block is numbered on the map, get a memorandum book and rule it as shown in Fig 1, and in this

Figure No. 1.

Block.	Business.	Residence.	Flats.	Total.	Pairs.	Remarks.
1	30		26	37	50	New Building Going Up
2	54		32	62	75	
3	10	8	38	24	25	Good Flats
4	8	6	42	22	25	
5	1	2	24	8	10	
6	3	8	12	10	15	New Flat Going Up
7	1	5	16	10	10	{ Leave Stub for New Business East of Fourth St.
8		7	18	8	10	
9	64		40	74	75	
10	43		70	61	75	New Building
11	9		50	22	25	
12	11		48	23	25	
13		16		8	10	
14		7	38	14	15	
15	5		36	14	15	
16	9		24	15	15	{ Trunks and Toll Lines

book put down the number of business places, private residences and families in apartment houses; the column marked total depends on the number of pairs you decide to leave for each style of service, the method chosen here being based on a four party selective system for apartment houses and residences as follows: Business places, 1 pair each; private residences, 1 pair for 2, and families in apartments, 1 pair for 4 families. This is assuming that you do not put over four on any line and more than that number will not give satisfaction.

Having figured out the total number of wires required for each block (taking into consideration all the conditions, such as new buildings, etc.), mark the size of cable needed on the map. After this is done you can see what size is required on the main lead between junction points. (Marked J1, J2, etc.)

As soon as it is decided on which streets aerial cable is to be used, the necessary permits for the poles must be secured so that the measurements for the cables can be taken, for, by knowing this, it is possible to order the cable in proper lengths; this is not so important in small sizes, but where large cable is used it is important, for if you are five feet short it means another splice, and if you are

five feet over, it is wasted, for a short piece of large cable is generally useless.

After the cable is marked on the map, make up a form like Fig. 2, which will show the size and length of each

Figure No. 2.

CABLE "A" 225 PAIR.

Box No.	Pairs.	CABLE SIZES AND PAIR.						
		10	15	25	50	75	100	225
A 1	101—150				264			
A 2	151—200					200		
A 2 a	201—225			110				
A 3	76—100			120				
A 4	51—75			215				
A 5	26—35	190						
A 6	36—50		220					
J 4	1—5 (stub)							
A 7	6—15	200						
A 8	16—25	210						
Manhole to J 1								380
J 1 to J 2							410	
J 2 to J 3					420			
J 3 to J 4				470				
		600	220	950	684	200	410	380

cable to the different blocks; also the pairs that are to be brought out at each terminal; the easiest way to lay out the pairs is to start at the end of the cable and work toward the office. In making this cable lay-out it is well to provide for any increase that can be reasonably foreseen, such as toll lines from the end of the cable or new buildings in the course of construction.

Referring to the map, the following explanation may be an aid to the proper understanding of it: Only a small portion can be shown, but the method described for the two cables "A" and "B" will apply to other sections of the city.

Each block is numbered, keeping the odd numbers on one side of the street and even numbers on the other; blocks 1 to 8 are served by "A" cable, which we find requires 225 pairs; this is not a nice size cable to put in a distributing board, and it may be possible, between the manhole at Main street, Ave. A, and the central office to take another tap of 75 pair out, thus making it a 300 pair cable at the office.

It will be seen that Ave. B has asphalt for three blocks and that is why Ave. A and Ave C would be chosen in place of Ave B if conduit was to be laid.

By numbering each block and lettering each cable you have a distinctive number for each terminal, thus as Cable A serves blocks 1 to 8, any terminal in that district will necessarily be seen at a glance, thus A8 is Block 8 on A Cable; this is a simple method of numbering and prevents any future confusion of a similarity of numbers; where two terminals are in one block, as in block 2, they can be numbered as shown—that is, A2 and A2a.

After laying out the whole city as shown for these two cables it is a simple matter to find out the number of conduits needed between each manhole, then decide how many extra ones are needed or advisable to place. There should never be less than two laid in any street, and four is generally as small a number as is advisable. In the next article conduit work will be considered.

The Dillsboro Telephone Company, of Dillsboro, Ind., has been incorporated with a capital stock of \$1,000.

# European Telephone Conditions

By F. LUBBERGER

Editor SOUND WAVES: Complying with your recent request, I herewith send you a few words about what I saw on my recent trip to Europe.

It was not my purpose to study the telephone situation over there, still, I had opportunities to talk with some of the gentlemen of highest rank connected with the National Telephone Company of London, and with the deciding authorities of the Imperial German Post-office. I am an "automatic" man, and, of course, the most interesting problem for me was, how the automatic system is regarded in Europe.

About the general telephone situation in England I can not say very much. I tried to use the 'phone several times, but usually got my information more quickly by taking the 'bus and driving for an hour. The English people did not take to the idea of automatic exchanges. I soon found out where the trouble was. They had seen the Strowger system when it was exhibited in the year 1898. Of course, at that time it was not so perfect as it is to-day. However, one prominent gentleman was said to be making a close study of American practice.

In Germany, all telephoning is controlled by the government. The highest technical authority is an under-secretary of state at the Reichspostamt at Berlin. The rates, expenses for new construction, rebuilding, etc., must be passed upon by the three law-giving authorities, viz.: the reichstag, the bundesrath and the kaiser. The results of such a round-about way to secure improvements are very noticeable. New things are introduced only if they are proved to be absolutely safe and profitable.

The rates are published in a little blue book. It takes a Chicago lawyer to find out what a man really has to pay. But the finest shadings of the rates are hardly interesting to your readers, so I will content myself with giving the principal ones. Every subscriber is entitled either to a flat rate or a counted call charge. Any telephone may be connected to the exchange by an individual line, or it may be connected to a so-called "main-station."

This "main-station" arrangement is something like the American private branch exchange. The number of "by-stations," or what we call local stations, is limited to five. The flat rates are per individual line and year:

- Exchange of 50 subscribers or less, \$20.
- Exchange of 50 to 100 subscribers, \$25.
- Exchange of 100 to 200 subscribers, \$30.
- Exchange of 200 to 500 subscribers, \$35.
- Exchange of 500 to 1,000 subscribers, \$37.50.
- Exchange of 1,000 to 5,000 subscribers, \$40.
- Exchange of 5,000 to 20,000 subscribers, \$42.50.
- Exchange of 20,000 and more, \$45.

Lines are to be not longer than 3 2-10 miles. If longer, an additional charge is made of 75 cents a year for single wire and \$1.25 for double wire systems for each 300 feet beyond 3 2-10 miles. The subscriber has to pay a share of the cost of construction if the line is longer than 6½ miles. His share is \$2.50 for single wire and \$3.75 for double wire systems for each 300 feet beyond 6½ miles. Common return wire is counted as double wire.

The rates for counted calls are a flat rate and 1¼ cents per call. There is charged in

Exchanges of 100 to 1,000 subscribers, \$15 per year.

Exchanges of 1,000 to 5,000 subscribers, \$18.75 per year.

Exchanges of 5,000 to 20,000 subscribers, \$22.50 per year.

Exchanges of 20,000 and more subscribers, \$25 per year.

The line is to be not longer than 3 2-10 miles, but if longer an additional charge is made. The subscriber must guarantee at least 400 calls per year.

If main-stations and by-stations are used, the above rates are to be paid for the exchange line, and \$5 per year additional for each by-station, if the by-station is located on the same property and \$7.50 per year if it is separated from the main-station by other properties.

There are some more wrinkles in the tariff. If an exchange grows during the year beyond the class, e. g., from 950 to 1060, the higher rate is charged in the following year, the subscriber simply being notified of the fact that he has to pay more. The rates seem to be rather high!

The main-station phenomenon is something very interesting. The people usually do not spend the money for an operator. The switching is left to a janitor, or typewriter, or servant, or anybody who is supposed to be mostly around the little switchboard. Sometimes these people are not there, and I personally remember my frantic efforts to call the fire department and could not get it until the fire was out. I think the postoffice is not to be blamed for this extremely annoying condition. The people having five 'phones on a main-station ought to pay an operator.

It is also due to the main-stations that common battery systems are so slowly gaining ground. The problem is to furnish talking current over one pair of wires of any length for three absolutely independent conversations. They say they have some schemes to do it, but seem not to be so very enthusiastic about them. I know that in this country it was experimented on with success, but for only a few lines per exchange, not for 50 per cent. of all lines. The perplexity comes by reason of the necessity of supplying talking and ringing current over a line in use. I was told that before remodeling one of the Berlin exchanges, about 14,000 dry cells—or probably wet cells—had to be cared for, and after replacing the local batteries by a central battery in the exchange, still 10,000 cells were required for the main-stations. The consequences of a law once fixed develop into very disagreeable conditions, and to change a law is easier said than done.

The most stupendous exchange in the world is in course of erection at Hamburg, Germany. This single exchange will accommodate 80,000 lines. The magnificent building stands four stories high and is about 600 feet long. It is located at the Schluterstrasse. The system will be the so-called Stockholm system, employing three operators for one connection. The line ends in a signal at the first operator's position; she does not answer, but by means of cords connects the calling line



with a free second operator. By signals it is indicated which second operator is free. The second operator answers and receives the order. Of course 80,000 lines can not be brought within the reach of a single operator, so the numbers are subdivided into groups, each group forming a sort of B board. These B boards are connected with the answering positions by trunklines and order wires. The second operator transfers the call to the required B board, and orders the connection by means of an order wire. The third operator—she at the B board—finally finishes the connection.

As to the introduction of the Automatic system, I was surprised at the enthusiasm of all parties. We, on this side of the ocean have not to contend with such extremely severe conditions; over there they haven't yet been quite lucky enough to meet all legal requirements; but all are very hopeful that in a short time every obstacle will be overcome.

Yours truly,

F. LUBBERGER.

[The foregoing letter was written shortly after Mr. Lubberger's return from an extended European trip, where he went to revisit his native land. The observant habits of the telephone engineer stayed with him during his visit, as the above letter amply attests.]

#### Mr. Harris' Letter to Editor World Almanac.

Editor *World Almanac*, New York:

Dear Sir: I have been a purchaser and reader of the "World Almanac" for several years, and in accordance with my universal custom, have just purchased a copy of the 1906 issue. Permit me to say that as far as your "Telephone statistics" are concerned they are a farce.

Your deliberate and studied attempt each year to ignore the Independent telephone interests of this country shows two very important motives underlying it all. Either ignorance of the subject which is inexcusable, inasmuch as there is an ample opportunity to obtain even in your own city and elsewhere if desired, complete information on the subject, or else, as one would fain disbelieve of such a publication, that its sympathies and interests are closely allied to the Bell Company. Or perhaps a third—that of pecuniary motives wherein the Bell Company pays for having the so-called "statistics" purely Bell in character.

Even in your summary of the "Electrical progress for the year 1905" you have carefully avoided any mention of Independent telephony. In your issue of January 1, 1905, you did recognize the existence of such an enterprise in the following words (used in connection with the "Bell statistics") "which at present practically monopolizes the telephone business of the United States." Again in "Electrical Progress for 1904" you said "The Independent companies have followed up their contest with the Bell interests by extending their operations from the rural districts and small towns and even some of the cities already occupied by their competitor."

What are the Independent telephone interests of the United States to infer from your present attitude in the matter? Why have you in the 1906 issue avoided all mention of them, even slightly as was done in 1905? It is easy to be seen that the "Bell interests" have brought their influence to bear upon you sufficient to cause you to omit all reference to our interests.

Had you been honest in your desire to present statistics of value and of fact, you would have taken your cue from your issue of 1905 and ascertained at least approx-

imate figures of the extent of the movement. This could have been done with very little trouble. There are a number of reputable Independent telephone journals, one of which is located within a stone's throw of your building, that would have been glad to have furnished you with reliable information.

As an evidence of the extent of the interests you deliberately ignore, let me call your attention to these facts.

There are in operation over double the number of exchanges that the Bell Company has, nearly three times the number of stations, over three times the amount of capital invested that the Bell Company has, and the number of large cities that have not been entered can be counted by the fingers of your two hands. Under such a showing do you think you are honestly giving us a "square deal" in thus voluntarily closing your eyes to this immense factor in the social and financial life of this country?

There are over three times as many employees in the Independent interests, a large number of whom are purchasers and readers of the Almanac. It is but fitting that their attention should be called to your glaring disregard of their interests and this shall be done at once.

An explanation from you in the matter will be welcome.

Yours very truly,  
C. O. HARRIS, Supt. Exchanges,  
Utah Independent Telephone Co.

The board of trustees of Angelica, N. Y., has granted a franchise to Frank Sullivan, as receiver of the Pittsburg, Shawmut and Northern Railroad Company, giving that company the right to build and operate a telephone system in said village.

The Oberlin, Ohio, Telephone Company has decided to issue bonds of \$10,000 to make improvements on their system.

The Crooksville, O., Telephone Company has granted the right to construct a new telephone system in this town.

Edward E. Webster, of Tacoma, Wash., general manager of the Independent Telephone Company, announces that the company will extend its system to take in all the territory between Portland, Ore., and British Columbia.

The National Telephone system, of Wheeling, W. Va., is to be improved in this city at a cost of \$500,000.

The Mutual Telephone Company of Shelbyville, Ind., will soon begin the construction of a new plant. The improvements contemplated will involve the expenditure of several thousand dollars.

A. L. Lewis and others of Chester, Mass., are considering the building of a new telephone line from Chester to North Blanford.

The Cold Brook Telephone Company, of South Stafford, N. Y., will build a new telephone line from Omer to South Stafford.

The Crieghead Engineering Co., is moving into larger and better quarters, at 340-342 Main Street, Cincinnati, O., where the company will have four times as much space as formerly. They have occupied their old quarters about three years but their steady growth consumed all space available and their continued growth makes the move necessary. Along with a full line of electrical supplies they carry a complete line of telephone construction material.

# Talks and Queries

## READERS, PLEASE NOTE

A large proportion of our readers send in queries without inclosing stamps, requesting that we answer by letter. We are glad to answer their inquiries so that they need not wait until the next issue for reply, but we must insist that postage stamps be inclosed, otherwise the queries will remain unanswered. Several have asked questions that would require a volume to answer, and in these cases we will have to refer the writer to books relating to the subject. We are sure that our readers will not feel offended if we do not go into elaborate details when the information can be found in standard telephone literature, written better and more plainly than we can explain it.

### Editor Sound Waves:

One pair of plugs and cords on my switchboard when connecting two lines will cut off and parties cannot talk. But if the listening key is on, they can talk all right, and operator can talk out over either of the cords.

I see nothing wrong with the connections and contacts about the key. Where would your suggest to look for the trouble?

### Answer.

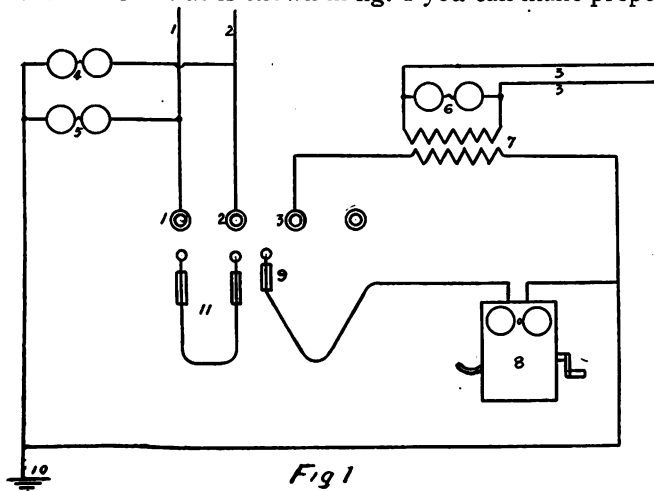
You have, no doubt, overlooked one of the key troubles that is quite common and that is a plunger that is so large that it presses on the springs when in the normal position. The operator in listening in on the circuit, relieves the pressure on the ringing springs and then the contacts close. Just as soon as she returns the lever to the normal position, the pressure returns and the trouble is again present. Bend the ends of the springs slightly so that the plunger is a little looser and we think that the trouble will disappear.

### Editor Sound Waves:

We have two grounded telephone lines running out from the central office. We wish to connect these with another rural line, a metallic line, running out from central to another town. Can we connect these lines with an ordinary plug board? Any information on this subject and how to install the apparatus will be thankfully received.

### Answer.

We presume that the plug board which you have in mind is the ordinary grounded plugging switch, in which case it would not be very satisfactory to make connections with a metallic circuit. By putting a repeating coil in the metallic line as is shown in fig. 1 you can make proper

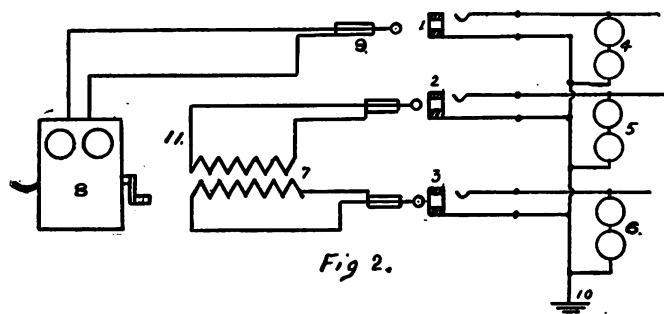


connection but there may be trouble in ringing if the metallic circuit is heavily loaded with instruments. The coil should be very heavy so that it will have a good ringing efficiency. In figure 1, number 1, and 2 represent the grounded line and numbers 3, 3, the metallic circuit.

Numbers 4, 5, and 6 are the extension bells of the three lines. Number 7 is the repeating coil, the primary of which is connected, one side to the socket and the other side to ground the secondary is connected to the line.

In calling, the ringing and listening plug 9 is connected into the socket of the metallic circuit and the current from the telephone 8 passes through the primary winding of the coil to ground. An induced current is sent out over the line and this induced current rings the bells. The repeating coil is made after the same principle as the induction coil in the telephone but larger and heavier in every way.

The better way would be to have a metallic circuit jack board as shown in figure 2. You will observe that



each jack is metallic circuit, whether connected with a grounded line or not. The grounded lines connect with the spring of the jack that connects with the tip of the plug. The sleeve contact of the jack is connected to the ground. The repeating coil is then connected to the cord circuit. In this case the cords and plugs have two conductors. You can easily trace out the circuit. All parts in figure 2 are numbered the same as like parts in figure 1.

The metallic line could be connected with the grounded lines without the repeating coil in the circuit but it would then be unbalanced and if long would be noisy.

### Editor Sound Waves:

I have five rural lines in an exchange all connected to drops on the switchboard. They are very bothersome after closing hours when the night alarm is turned on. Parties ringing others on the same line, throw the drop and start the night alarm bell.

Is there any way by which this can be remedied? The lines are grounded.

### Answer.

Disconnect the drops and use extension bells instead. You will then hear the bell and the operator does not have to respond except when she hears her call. If you do not care to give night service to the rural lines, disconnect the night alarm contacts on the drops connected with the rural lines.

Editor Sound Waves:—

We have a switchboard on the grounded system and of course there is some cross talk, which we cannot cut out entirely. This has lead to a discussion here among the telephone people. One man claims that by grounding each drop separately he can do away with most of it. Is there any difference between having one ground for all the lines and a separate ground for each line?

Please let me have your idea on the subject, for it will be very highly appreciated.

Answer.

To settle your dispute we will say that both parties are right so all bets are off.

If you can get a perfect ground one is sufficient for the switchboard but if that is not possible the method of separate grounds will be more effectual. If there is any resistance between the board and ground, the telephonic currents will be thrown out over the other lines and to the grounds of the other telephones. Thus any one who may have his receiver down, may hear what is being said. Where separate grounds are used, the very resistance of the ground will prevent the current from going back on the other lines. A good water pipe connection will do as well as any thing possibly can do. A metal tube lining a drilling well also makes a perfect ground connection. The main thing to have is a ground that is of large surface and deep enough to be always in contact with moist earth.

Editor Sound Waves:

Will you please tell me which side of the cross connecting board is proper to connect with the line cable? The side that has the carbons or the other side?

Answer.

In connecting the cross connecting board to the system you should have it so that the carbon block arrestors are on the side next to the line, if there are fuses on the board also. If you do not connect in this way, the carbon arrestors will be out of use when a fuse blows. The carbon blocks should always be in position to discharge the line.

Editor Sound Waves:

We have a toll line twelve miles long which at times becomes so noisy that is is almost impossible to talk over it with any satisfaction at all. There are five lines on the lead and only two transposed, these being the end pairs, that is, these occupy pins number 1, 2, 3, and 4. They are transposed alike every half mile and are the ones upon which the noise occurs. The lines are of No. 12 iron. When we send a man out to test on line it is nearly impossible to hear him talk with a receiver till he has opened the line, then we can hear him as well as though the line were all right.

Do you think that this trouble is caused by electro-static induction, and do you think that this can be remedied by transposing these lines different, or would it be more advisable to transpose the whole lead according to the plan you give in the February issue of Sound Waves?

These lines show no other trouble but that of being noisy. They are paralleled by a street car line throughout their entire length.

Answer.

We think that your trouble is due to poor insulation

on the line or because of unbalance due to one side of the line being of higher resistance than the other. To have a line perfectly balanced, both sides must be of exactly the same resistance, the same size and should average the same distance from any disturbing element.

The fact that the noise disappears when the line man opens the circuit would make it appear that the trouble is beyond the point where he makes his test. We would suggest that you go over the two lines in question and see if there may not be a fuse out on one side of each line. This would not prevent talking and might prevent ringing but there would be an awful noise on the line. The writer remembers during his early experience that he was nearly driven distracted trying to find a case of trouble in a trunk line three miles long. It could be talked over and signalled over but the noise was something to be avoided. Not being familiar with the fact that it was possible to talk over an open circuit he found the trouble baffling. The trouble was due to an open heat coil which had not snapped back. We would suggest that you test the switchboard connections at each end for grounds or bad connections. If the other lines on the lead are not given trouble we hardly think that the trouble can come from electro-static induction. It is a good idea to, to transpose the circuits like that shown in the February number of Sound Waves. The way you have them transposed, they will not be free from mutual cross talk though they will be free from induction from other circuits. It is usual to transpose more frequently when the trolley lines parallel for so long a distance.

### CHICAGO LEADS THE WORLD.

The American consul general, Mr. Mason, at Berlin, has made an interesting report on telephone service in Europe. W. Bodemann, a Chicago druggist, and exponent of the Chicago Telephone Company's measured service system, in a letter to the organ of the National tract from the "*Wochenblatt*," and comment thereon, that will interest telephone people, in whatever camp their sympathies may lie:

"Berlin has 25 per cent of all telephones in Germany, and except London, the largest number in a European city. It is therefore natural to compare Chicago with Berlin.

"Berlin has 66,744 and Chicago 101,000 telephones. A Chicago man can, therefore, reach nearly 50 per cent more people than the Berliner. The imperial regulations permit the Berlin exchange to embrace only those exchanges within five miles of the central exchange, and that results in 22 square miles, versus 83 square miles in Chicago—in spite of the fact that Berlin is compactly built up. Most messages in Berlin travel two and one-half miles—from Edgewater to Auburn Park, in Chicago, it is seventeen and one-half miles.

"In Berlin all telephone service between 10 p. m. and 7 a. m. is subject to an extra charge amounting to 5c.

"In Berlin the government manages the telephone service and jumped up on the cost 25 per cent—and the subscriber who wants to have the measured service has to pay \$24.30 extra rental. The Berlin telephone operator earns \$2 a week—Chicago pays easily five times \$2. Berlin has the old-time crank ringer—Chicago introduced the automatic ring ten years ago—the first city to introduce this convenience. Berlin has the old station ring yet—Central calling up an exchange and the subscriber has again to ring for his party"

# Our Duty to the Public

BY J. L. W. ZEITLOW

When, in 1886, I suggested the practicability of a telephone line connecting the prominent towns in the northern part of the State, my friends felt greatly alarmed about my mental condition. Later it became known that I was planning a trip to Washington for the purpose of carrying my idea into practical operation, and strange stories were set afloat. So that when I departed people shook their heads doubtfully; some of them shook hands with me as though I was never to return, and even the fellow who had a small bill against me pressed his claim very ardently.

I returned with a couple of telephone instruments and strung a wire from my house to the postoffice. It was considered a wonder, but looked upon as a plaything; something which was out of reach of the ordinary Dakotan. Business men discouraged my efforts to organize the first exchange, regarding a telephone as a luxury entailing a useless expense.

When I built the first long distance line many of them thought they would prefer to drive forty miles, spend from \$3 to \$5 for expenses, and lose a day's time rather than pay 25 cents for a telephone message. A prominent banker said: "The successful business man should not use the telegraph or telephone very often; if he does I have my suspicions that there is something wrong." Two years afterward, when he used the long distance telephone line sixteen times in one day, I asked him if there was anything wrong with his business, and he, of course, was indignant at my impudence, but when I quoted his own words, namely, that the successful business man should not use the telegraph or telephone very often, he remarked, "I used to think so, but the telephone has been the means of enabling us to enlarge our field of operation, and I am compelled to use it in order to keep up with my competitors." This statement describes the situation as it exists today.

We build telephone lines and exchanges and solicit the public to avail themselves of our service. The people become accustomed to a new condition of things; learn to depend upon it, and look upon the telephone as an ever-ready messenger to do their bidding, not only in ordinary, but very important business affairs as well; even in case of sickness or accident, when fire threatens to destroy property, or burglars seek to enter the home. Yes, when death shows its ghastly presence, the public has been taught that by the aid of the telephone they can quickly summon help and friends in the hour of need. This being the case we cannot over-estimate the responsibility we assume when we induce people to accept our services. Then what is our duty to the public?

First of all we should realize the importance of the undertaking, should acquaint ourselves with methods and means to render the best service possible to the science of telephony. We should build such lines and exchanges, use such equipment as will handle the business with the least amount of trouble and delay, employ obliging and competent help, for nothing is more exasperating than when in the hour of need you find your telephone will not respond, or if it does, central is incompetent, dilatory or even saucy. Is it any

wonder then that people get dissatisfied and denounce the system, when at a critical time they fail to receive proper attention and service? Of course it is impossible to satisfy everyone, for many unreasonable demands are made upon telephone service, but it is our duty to do the best we can for the public, and leave nothing undone which might improve these conditions. We should also realize that the business intrusted to us is to be treated with absolute secrecy, and that nothing which passes over a telephone line is divulged. We should see to it that the public gets fair treatment.

In order to give service, as outlined above, the matter of rates become a very important question. We cannot assume this responsibility and render good service without compensation, and the public must be taught that they should not expect it. Service for which no one is willing to pay must necessarily be unsatisfactory; on the other hand, it is our duty to see that the charges are not exorbitant. When we contract to furnish service at so much per month we should make this figure adequate to meet all expenses entailed to furnish the same, but we should not undertake to add to it, as is very often done. Paying from \$1 to \$4 per month for telephone service should entitle a person to the full use of the same up to the point agreed upon, and a perfect understanding should be had so as to avoid dissatisfaction. A great deal of antagonism is created by people being compelled to pay 5 cents or 10 cents toll rates when talking to and from their own places of business, over instruments to the unlimited use of which they are entitled by paying a fixed rate per month, and we should see that such practice is not permitted. When a flat rate is named this should be proportionately sufficient to cover all expenses and charges incident to the running of an exchange. When a toll line is built into a town the party handling the same is entitled to compensation for his services only, as he has nothing invested, and when a toll company pays a commission it should not be permissible to allow the exchange manager to add 5 cents or 10 cents, to be paid by his customer, who is already paying for the service rendered him.

It is also our duty to protect the public against imposition. We should expose questionable means in promoting telephone enterprises, such as the selling of stock and bonds on greatly over-capitalized institutions that never will or can pay a dividend; the taking of notes for such work, and the collection of the same in the hands of a third party should be exposed, as they are very detrimental to a healthy public sentiment. I will not dwell at length on this point, as the people in the southern part of the state have been made to feel the result of such practices. We should also endeavor to convince the public that the so-called "mutual telephone companies" who undertake to build lines and make no allowance for running expenses, cannot furnish satisfactory service. The great tendency is to promote these lines, but I am also glad to note that people are learning, though by bitter experience, that they have been imposed upon by listening to such misrepresentations. I have in mind one concern which was selling stock among farmers to about



three-fourths of their requirements. A few shrewd manipulators constructed the lines and incurred an indebtedness. Under guise of needing more money they secured the consent of the stockholders to bond the plant. They defaulted on the interest, the property was sold by the trustees, and the farmers who subscribed and paid for the stock were forced out, and made to pay regular rates, notwithstanding the fact that they were promised free service. We should also expose questionable means of the trade; for instance, while in Chicago last spring I saw an order for wire from a much-advertised telephone and supply company instructing the manufacturers to ship the same to a customer of theirs. The order contained the significant notation "Ship steel or fence wire, but mark B. B." I am sorry to say that this sort of business is practiced, not only in wire, but other supplies and it is our duty to expose anyone we find resorting to tricks of this kind, because legitimate telephone interests must suffer on account of such practices.

Another duty is to see that the values of telephone properties is not overrated. There is a tendency to build cheap lines, buy cheap equipment, and operate the same for a year or two with incompetent and indifferent help, spending nothing for keeping up the system, in order to make a big showing. People often deceived themselves by believing that they are actually making large profits, when in fact they are losing money, which they would realize if they took into consideration the fact that their property is depreciating and they are not giving the service promised and for which the public is paying. I remember a stockholder of an exchange saying to me, "Why, we can not afford to keep a lineman, because if we did we could not pay anything on our investment." Upon being asked what they were paying, admitted that they had paid 10 per cent., but by not rendering the service the public was paying for they created a great deal of adverse sentiment.

It became known, in fact it had been published in the papers, that a certain exchange had paid 32 per cent., and upon reading this statement people became "telephone crazy;" they demanded cheaper rates, under threat of building their own lines; legislatures heard of it and undertook to enact laws that would make such enormous profits impossible; the state board of equalization felt it necessary to undertake to raise the rate on all telephone properties on account of the enormous profits reported from this exchange. I combated the idea before the legislature, and before the board of equalization, trying to show them that such a thing was impossible at the rates charged by this exchange, and upon investigation found that these people had paid 32 per cent., not, however, per annum, but once in four years. Upon looking about I found their system to be in a horrible condition, their outside work demanded immediate attention, in fact, needed to be rebuilt, their switchboard and equipment was in great need of repairs, and the money which they had paid for dividends in four years should have been put into the exchange, in order to enable it to render the service the public was entitled to, and yet it took a great deal of hard work to explain the actual conditions as they existed; and even at the last legislative session a member from this very town undertook to work up a bill that would regulate telephone rates, as a result of the false impression created in that community. Such

statements are detrimental, and we should see that they are not published broadcast.

I once heard an exchange owner make a statement in the presence of a number of business men of his own town that his exchange was a very good proposition; that from mere nothing he had been able to build up an exchange which was worth \$12,000, the operating expenses being nominal, the toll lines paying for all necessary help, and the money received from his subscribers was clear gain; and inasmuch this party was rendering rather indifferent service, one of the parties who heard this statement, applied for a franchise, organized a company, and built an exchange, all on account of the first party's claiming that it was all profit. The first party's exchange being, as is usual in such cases, in a dilapidated condition, he was obliged to spend a large sum of money to rebuild his entire system, which he succeeded in doing, but his profits were gone. The people of the town, however, paid for two telephones and received divided and inferior service; service which should have been rendered by one exchange, and where one telephone would have been sufficient, could, however, only be reached by the use of two, with consequently double expense. This is certainly something that should be avoided. Had the first party been discreet and used some of the profits he was boasting about to keep up his system he would not have had opposition and people would have received service at greatly reduced rates.

Hence it is our duty, not only to deal honestly with the public, but to be honest with ourselves, and thus save a great deal of unnecessary trouble and adverse criticism; denounce and take action against all transactions which do not promote public as well as our own welfare.

[Delivered at Sioux Falls, S. D., at the annual meeting of the South Dakota Independent Telephone Co., Jan. 10, 1906.]

### Telegraph Notes From Unknown Europe.

BY FELIX J. KOCH.

Primitive as we are accustomed to supposing the east coast of the Adriatic to be, the net work of telegraph is fairly complete, and in Istria, at every railway station, as in America, the operator is installed. There, and in Montenegro, like the postoffice, the telegraph is a government institution. Even little Montenegro has its wireless telegraph system, owned by the Prince himself, at Antivarri, when the Grand Cordon of Montenegro was conferred upon Signor Marconi.

At Buda-pest, in Hungary, the newspapers, one and all, publish the same telegrams from outside, and such a thing as "scoop," or "beat," is unknown. Hence, much of the necessity for haste in journalistic telegraphing, that is so apparent with us, is there obviated.

Even the higher Carpathians, in the vicinity of Schmecks, have now been connected by telegraph with the greater centers. In Roumania the telegraph and the post-office are conceded by the poverty-stricken people to be about the only exemplary institutions of the government.

From Belgrade, Servia, the frequent regicides make cable tolls to the press agencies, an important factor in the telegraph offices, though strict censorship obtains.

The Mutual Telephone Company, of Shelbyville, Ind., will soon commence the erection of their new telephone building at that place. David B. Wilson, of Shelbyville, is the president of the company.

#### Fourth District Illinois Independents Meet.

The first convention of the Fourth District Illinois Independent Telephone Association was held at the Illinois Hotel, Bloomington, Friday Feb. 23, 1906. The reception committee was composed of I. C. Sabin, Maro Farwell and F. J. Cutting. The following program was carried out:

TEN A. M.

Registering of Visitors.

TEN-THIRTY A. M.

Address of Welcome ..... Mayor James S. Neville  
Response ..... Manford Savage, Champaign, Ill.  
Appointing Officers.  
Adjourn for Dinner.

ONE-THIRTY P. M.

Address ..... B. F. Wasson  
"The Independent Man" ..... Manford Savage  
"The Sub-Licensee Game in Theory and Practice,".....  
..... Prof. J. C. Kelsey, Chicago  
"Financial Phase of Independent Telephony,".....  
..... C. B. Cheadle, Joliet, Ill.  
Question Box ..... C. H. Coffman, Clinton;  
E. D. Childress, Farmer City; Wm. Corwin, Lincoln.  
Reports of Committees.  
4:30—Adjournment.

#### The Sublicensee Game in Theory and Practice.

BY PROF. J. C. KELSEY, CHICAGO.

About 1898 the sublicensee game was devised and put into practice by the very capable Mr. Wainman, General Manager of the Northwestern Telephone Exchange Company, a Bell licensee concern, with headquarters at Minneapolis.

That it was a crafty thing is proved by the success of the Northwestern Company in delaying competition long after other licensee companies had been practically ruined. Witness the Central Union, the Iowa Tel., the Mo. & Kan. Tel., and the Michigan Tel., who utterly ignored this seductive game.

In spite of this game the Northwestern territory around St. Paul, Minneapolis, Duluth, and West Superior, is now in the hands of the Independents. But this has only been conceded for a year. But look at many other Bell concerns of like character. They were whipped long ago.

When this sublicensee idea was first suggested at the Mecca of all telephone religion, rumor says that the Boston officials decried it, but not having control of the Northwestern Company, were forced to accede.

The sublicensee game was based on two theories,—I mean one theory and really one fact. First: The Northwestern Bell officials did not believe in the practicability and success of a small town telephone plant, and while they complacently predicted their final and utter ruin, were willing to do their toll business while their willing brawn and capital lasted.

Secondly: The Bell concern did not have the money to go into competition, even if they did have franchises and the good will of the local people. I know you will scout this idea of Bell poverty, as most people think the Bell Company runs a mint in connection with their business. But they did not have the money to go into the outlying districts, because they needed every dollar to develop their large city business, and entrench themselves for competition. They could get credit at the Western Electric Company for switchboards, telephones, cables, etc., but ducts, buildings, poles, and labor had to be paid for. Hence their desire to enter into an unholy alliance with the outlying independent on a sublicensee basis.

We all know that the first consideration was wrong. Small town properties have made great successes. Their hold on the people is strong, and the telephone habit is permanently strong even on the resident of the smallest town. It is no fad nor fancy, but a necessity. The outlying exchanges have grown so strong that the Bell Company has no hope of competition. Witness Mr. Wasson's district. Let Mr. Wasson become ever so tyrannical and mean, which is impossible, of course, and the people would still hang onto him to the exclusion of the Bell. They have learned their lesson. He has no fear of competition.

The Bell Company everywhere, realizing the strength of the local concerns, began a strong sublicensee campaign. They have regaled the local man with the beauties of a long distance connection to Chicago, New York, and Boston. They possibly have told him that with long distance Bell connection, he will increase his subscriber list. And they probably have told him that they would compete with him if he did not accept.

The long distance feature is a very doubtful one. Consider Clinton or Champaign. How many subscribers would Mr. Wasson gain if they or Mr. Savage had Chicago connection? Not ten. They built their plants on a pure local basis. By getting supremacy in Clinton or Champaign they gained 90 per cent in strategic advantage. By connecting up the county towns and farms they gained 9 per cent more. If they would sign a sublicensee contract today, they would stake their 99 per cent advantages against what they could get out of one per cent. If all their lines were cut at the county line they would not lose five subscribers. Likewise, any company strongly entrenched in a county is practically independent of the rest of the world.

We all over-rate our toll business. I know of a man who put \$10,000 in a toll line proposition, and the annual receipts were \$3,500. He called it a 35 per cent proposition. He forgot that his operators were on the local pay rolls, in offices whose rent was paid by the local exchange, and whose light, heat and power bills were all charged to local expense. He did not give the local exchanges credit for the use of their tracks or lines. Do you suppose you could build a short railroad into Bloomington and run your trains over the Chicago and Alton into Chicago without paying for the use of the tracks?

So when you add up your toll receipts, do not forget to put in all proper expense charges. If you do, you will look more carefully after your 99, and not after your one. You remember much more fuss is made over the lost sheep than the 99 that stayed at home.

So, my friends, you have a nice little property worth more than you suspect. You are monarchs of all you survey. You do not need the Central Union, and they need you. Their past has not been a career of philanthropy. They are deeply in debt now, and can never repay what they owe. Nobody but the milkman can really sell water. He who borrows must pay. The Bell Company must repay. Stay away from them, and when the receiver stalks in the land, I hope you will be sure that your little sublicensee contract has not made you a party to the receiver's hammer.

Co-operate with your neighbor, and help him. No man ever really succeeded who climbed over his neighbor's shoulders. He must carry his neighbor up with him. If your neighbor is a little hoggish, don't get mad and leave him. Many a man, mad at a young woman, has married another woman in spite. When he wakes up his repentance is too late. Likewise, the independent

operator. If your neighbor angers you, don't marry the Bell; while you can get a divorce, it is a difficult proceeding.

I would like to see every man, now sublicensee, come back to his original position of absolute independence. The 99 who did not stray will rejoice over the recovery of the lost one. History has always rejoiced over the prodical.

I hope that the next few years will witness the death of the sublicensee proposition. At a glance it looks harmless, and one suspects even benefits. But the devil's greatest weapons have the most innocent appearance. When one sees "Philanthropy" stalking forth from the portals of this heartless corporation, guided by New England aristocrats, pretending to do good unto the middle west independent operator, there is just cause for suspicion. Before you accept any favors from this animal, look you beneath its garb of sheep's clothing to see if it envelopes a shaggy wolf.

[The foregoing address was given before the meeting of Illinois Independent Telephone Association, Fourth District at Bloomington, Ill., Feb. 23, 1906.]

### Securing Business in a Telephone Exchange.

We have received from one of our readers a letter, the following being a copy of it.

"The chief operator of a large independent exchange in California made the statement that 'Solicitors are not necessary in the establishing of a telephone system,—all that is necessary is to secure a franchise, construct the system, erect the building, place the switchboard, and subscribers will come to the company without further trouble other than informing the public through newspapers, circulars and notices, what a good thing is open to them.'"

With your wide experience, I for one, would like to hear an expression from you on the subject. Also that if an efficient solicitor is an acquisition to a company, when are his duties most effective; before or after construction? What is the chief operator's position to a company in so far as the upbuilding of the revenues are concerned, compared to a capable solicitor for subscribers?

I believe much of interest can be written on this subject if space could be allowed to correspondents in your valuable paper."

The above letter affords a good starter for a very valuable discussion and we hope that our readers will take up the matter and express their opinions freely. These columns are for our readers and such matters of general interest are more valuable as they show the opinion of numerous people. One of the most difficult tasks the editor has, is that of securing the co-operation of the subscriber on points of general interest.

A telephone system like any other business venture must have an efficient department of publicity for the promoting of the welfare of the company. Of course an independent company may start in and build the exchange and get a fair amount of business simply through the medium of news papers and circulars. These are needful and are of great value, but such means will not secure all the patronage that is possible. There is always a class that must be solicited personally, and this class is very large.

Not one company in ten have any idea of the possible extent to which their business may grow. When they find that they have twice the number of subscribers that have been secured by the Bell, they are satisfied to rest on their oars. The number of subscribers can be limited only by size of the population. When every business place and residence is provided with telephone

service, then the exchange may rest contented.

Many business houses have but one telephone line when there should be two or more, in order to take care of the orders properly. It takes some hard personal work on the part of the solicitor to show a man that he is shutting the door upon a number of customers, by not giving them adequate telephone communication with his place of business. One company that we have in mind, keeps one solicitor busy all the time working up the private branch exchange business. Before the system is built, the services of a good mixer is invaluable for the creating of friends for the new venture. Officials of the city need constantly to be pacified and kept in good humor. The opposing company is not slow to take advantage of any weakness in the armour of the other, and the solicitor must be in position to counteract such opposition.

The chief operator of an exchange does not generally come in contact with the business end of the system. It is the usual duty of the chief operator to keep order among the operators and to take care of any complaints from the subscribers. Of course the office of chief operator may vary in the different systems, but the usual arrangement does not permit a direct effort on his part to secure new business. Of course the discipline which he obtains on the part of the operators, helps in no small way to make the service popular.

A telephone system will not take care of itself any more than any other business. The telephone is a necessity and every man in business must have one. Every home should be so provided but most of the householders and some of the business houses must be shown.

What do the rest of our readers think?

### Toll Lines and What They Mean to Us.

BY R. A. WALKER.

The topic which has been assigned me for discussion seems to me to be of more importance to the Mutual and Independent Telephone interests than any other one thing. "Toll Lines—and what they mean to us."

It need no elaborate discussion to convince the exchange manager of our crying need for toll lines, the thing that is giving us more concern in our competition with the Bell Companies. We now have, more exchanges in this state than the opposition and far more subscribers; then it but remains for us to supply efficient and sufficient toll lines to properly connect our several exchanges binding them together into one unbreakable chain, safe from the allurments held out by the sublicense contract, increasing the value of our exchanges, insuring the stability of the investments and will give Independent telephone securities standing in the open market.

You owe it to yourself to use all of your influence and energy toward building or inducing others to build efficient toll lines in your territory, as you will find especially in the state of Iowa that the opposition are making every effort to secure connecting contracts with isolated Independent exchanges, under almost any conditions that you might name, in this way using one exchange to help them in their fight against the others, incidentally making the sublicense work against their own interests.

Again I say our need is efficient toll lines, through and local circuits that will give prompt clear cut service. Let us give every encouragement to the Independent Toll line companies, and the only way that this can be done

is to make these investments profitable. We can not hope to hold the isolated exchanges in our ranks by their love for the movement, that we represent, alone; but must be able to supply them the same class of toll service that they can secure for their patrons from the Bell Co. We must hurry it along. Many a telephone manager has placed himself in the ranks of the opposition because they thought only of the needs of the today without thought for the future, help these men by showing them that the lines they need are not only coming as they must but are now under way.

Among the things that have stunted the growth of the Independent toll lines is the great amount of free service that has been supplied in the past. There may be instances where flat rate inter town service is advisable for neighboring points, but am unable to see where unlimited free service will be to the best interests of any concerned. It can not help but cripple your local service and work a hardship on the many for the benefit of the few. We can not hope to have investments made in toll lines if they are to be paralleled by free service lines. The public has become prejudiced against the toll service which has been rendered by the Independent companies in the past, and looks to the opposition when they want long distance service. This must be changed, and when it is, together with our great advantage in exchanges the combination will be irresistible. Again, if we as small exchanges, are unable to make the necessary investments, let us extend an open hand to those that are that there may be no delay in completing these much needed circuits and there will be but little of this sublimed business.

To those that have toll lines, no matter how small these interests may be, let us get on a basis that is right. Identify yourselves with the Independent Telephone Clearing House Association which has been established for the purpose of checking all of the interchange toll business between the different companies as well as the business over your own lines if you so desire.

Make contracts and working agreements with each other in writing insuring stability to the arrangements and ward off misunderstandings. At the last meeting of this association suggestions were made and a resolution past fixing what was considered just and equitable terms between the toll and exchange companies.

Let us feel that this organization is not in existence but twice a year and then at the meeting but that a lodge in which the fellowship is continued throughout the year, a lodge of Modern Boosters for the Mutual and Independent (if there be a difference) Movement, establish a lodge in every city, town, and village and for the badge that we may know one and another by, we'll use the Shield. The National Interstate Telephone Association has been established to look after our interests as a National body and have sent out as our unity cry "Look for the Shield." Put the Shield on your signs, letter heads, envelopes, cards, and wear a Shield button on the lapel of your coat. Let every man wear a Shield, talk and think Shield. Look for the Shield and Boost for the cause that the Shield represents. If you see a man without the Shield, ask him why. When we have this band of "Modern Boosters" organized we will have something done in the toll line business. We must have the toll lines, men. Boost for them.

[Delivered at the meeting of the Northeastern Iowa Independent Telephone Association at Vinton, Iowa, Feb. 13.]

## WHAT THE INDEPENDENT TELEPHONE INTERESTS NEED

BY C. O. HARRIS

Any one at all actively engaged in Independent telephony must have felt the need of a greater publicity as to the continued growth and wonderful possibilities of the movement.

Our friends "the enemy" lose no opportunity to keep their affairs prominently before the public. Every magazine, financial journal, the daily and weekly press (and even the Independent telephone journals at times) are seized upon and used as an advertising medium whereby it is made to appear that the "Bell" telephone is the "only" one, that the growth of its stations is marvelous, that its "daring engineers" as Mr. Coburn terms them, are "sitting up nights" as it were contending with the enormous problems that confront them in their philanthropic and laudable efforts to cater to the great American public.

A corps of writers is engaged at the great center of literature and would-be finance (Boston) whose literary efforts are directed towards creating an erroneous impression that this great American public is with it heart and soul in its philanthropic and public spirited efforts to extend its lines and business.

No one knows the great American public better than the average telephone man. The very nature of the work makes it public in its character. Its patrons are the public. It is right there in its dealing with the public that the need of greater publicity is felt.

Every active worker has felt and deplored for years the lack of reliable, authentic figures showing the growth of the Independent movement as regards number of telephone stations, number of exchanges, increased toll line mileage, values of stocks, capital invested, etc., with a corresponding showing of the Bell Company's decrease; figures that are absolutely correct and that can be used in combating the erroneous statements that are constantly being made by the opposition.

As an example of this, permit me to recite an incident that occurred recently. The writer had occasion to appear before a city council in whose hands there was pending an application for a telephone franchise. The granting of it was vigorously opposed by the opposition and both sides were notified to appear that evidence pro and con might be heard.

While the arguments were in progress the opposition presented a mass of figures so altered as to appear as if with but few exceptions the Independent movement had been an acknowledged failure everywhere; that the Bell company was buying Independent exchanges right and left; that the Bell company had several million more telephones than the Independents and other erroneous statements that the writer was obliged to refute.

The statistics furnished the World Almanac by the A. T. & T. Co., for January 1, 1905, were changed by them to read double the number, and it was only after repeated attention had been called by the writer to this glaring misrepresentation of facts that they had the good grace to acknowledge their error. In fact, the mis-statements made were so evident that the council recognized the motive and granted the franchise.

Intimate personal acquaintance and the popularity of one's service has considerable to do with gaining favorable consideration, but the business men of to-day want "to be shown." Every active worker has a mass of in-



formation at his tongue's end and gleaned from chance statistics compiled at various times, some of them bearing anything but the stamp of authenticity. In using them he is liable to make erroneous statements. The writer suggests the establishment and maintenance of a Bureau of Publicity of the Independent Telephone interests, whose duty shall be to collect and disseminate reliable and positive information as to the condition of affairs to be gathered and sent out monthly.

A blank could be easily prepared and furnished the various companies, upon which to forward information at a nominal expense, these to be forwarded to the Bureau at the end of the month. As soon as the totals were compiled a bulletin would be issued and mailed to every company showing the almost exact condition.

The expenses of such bureau should be borne by annual subscription not to exceed \$5.00 per year. It is worth many times that to even the smallest company. There are several thousand companies in the United States and Canada and the regular monthly statement would be of incalculable value with the advantage of its being authentic, up to date, and the information gleaned from it of uniform character. Any brief items of vital interest could be made a part of it and thus reach the working factors that comprise the real movement.

Our journalistic and news bureau friends are doing a magnificent work in supporting the movement, with but one exception. They are altogether too prone to give space to the opposition, who insert their advertisements under the cloak of general telephone articles and statistics. There are so many valuable journals that it would be unfair to designate any one of them as the official organ.

Another and seemingly reasonable argument is that the general public does not know of, or ever read the telephone journals. Over 75 per cent (and possibly more) of their circulation is within the ranks and while there is hardly an issue that does not contain some very valuable information, the scope of its predetermined influence is confined to the telephone man, instead of to the public. Despite the excellence of many of the statements, one does not always know as to their correctness or origin, and has only his own supposition to endorse it.

If, as suggested, the statement was issued from the bureau, all doubts as to its genuineness would be removed and the subject matter could be used whenever desired. A number of "news bureaus" (very worthy mediums) are circulating telephone news, but they are simply made up from clippings from local papers that are liable to distort the facts either unwittingly or through prejudice, and local affiliation. In many cases these are paid articles emanating from local Bell companies and are paid for at 20 cents per line. "News bureaus" are not expected to know this, and unconsciously act to spread statements that are not warranted by the facts.

As an evidence of the correctness of the writer's position on the subject of the utilization of the various publications for Bell interests permit me to call your attention to the recently issued World Almanac for 1906. Under the head of "Telephone Statistics" it publishes a mass of figures furnished by the Bell Company. In both these so-called "statistics" and in its general information regarding "Electrical Progress" mention is studiously avoided of the Independent telephone interests of the world, while it is made to appear that the Bell is the only telephone system.

The writer has felt it his duty to call to the attention

of the editor of the World Almanac this glaring disregard of the Independent Telephone interests and encloses copy of letter sent him.

How any reputable publication depending upon the public for its patronage can thus permit itself to lend its pages to the advertisement of interests that are but secondary to the greatest factor in the commercial and social interests of this country is past finding out.

Let us have a Bureau of Publicity from which statistics that are statistics can be furnished.

The American Automatic Telephone Company of Rochester, N. Y., has filed articles of incorporation at Albany. The company is capitalized for \$1,500,000, of which \$500,000 is in 7 per cent. cumulative preferred stock. Of the amount of the capitalization, \$650,000 was paid in at the time of the incorporation and since that time a considerable additional sum has been subscribed. The company will manufacture automatic telephones and switchboards. The officers and directors of the company are: President, Senator John Raines, of Canandaigua, vice-president and general manager. J. W. Lattig, one of the inventors; secretary and treasurer, B. J. Williams, president of the Shelby, Ohio, National Bank, directors: The foregoing and Alvard L. Thompson, of Ingmire & Thompson, Rochester, N. Y.; Henry H. Stebbins, Jr., Rochester; Joseph R. Webster, and Geo. R. Raines, lawyers, of Rochester. J. W. Lattig and Charles L. Goodrum are the inventors of the system.

At the annual meeting of the Nebraska (Bell) Telephone Company held at Omaha recently the directors authorized the officers of the company to spend one million dollars in improvements throughout the State during the coming year. By this action it is quite evident that the Nebraska Bell people are waking up to the necessity for improving the service. The Independents are strong in Nebraska, and the fight in Omaha for an Independent franchise has had at least one good effect, no doubt, that of prodding the old company into spending some of the money it has taken from the people in giving back to them a part of the service to which they are entitled.

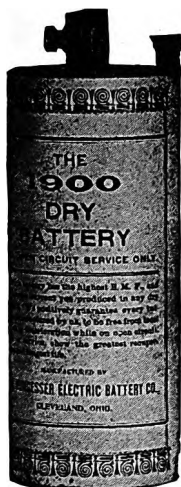
The officers of the Cuyahoga Telephone Company of Cleveland, O., have issued a neat report in pamphlet form of their business for the year 1905. Among other things the report shows that \$719,502.14 was expended for improvements during the year and that increased switchboard capacity was installed in the Shore, Chagrin Falls, Independence and Mayfield exchanges. The report is complete and shows the company to be in a prosperous condition.

The Inter-Ocean Telephone and Telegraph Company of Buffalo, N. Y., is sending out to its friends and patrons a little folder entitled "Independent Talks" published for "Your Benefit and Ours." Its purpose is to advertise and boost toll business.

The Twin City Telephone Company, of Benton Harbor, Mich., proposes to spend the sum of \$33,000 in putting its wires in the main part of the city underground, and making the plant there the best possible.

# The 1900 Dry Battery

IS THE KEYSTONE TO  
A PERFECT TELEPHONE



FOR SALE BY ALL  
THE LEADING  
DEALERS  
AND  
TELEPHONE  
MANUFACTURERS

FOR SALE BY ALL  
THE LEADING  
DEALERS  
AND  
TELEPHONE  
MANUFACTURERS

THE NUNGESSER ELECTRIC BATTERY CO.

CLEVELAND

GENERAL SALES OFFICE  
No. 128 WEST JACKSON BLVD.  
CHICAGO

## What Are Your Intentions?

Are you figuring on improving the service of your telephone system or are you going to go on in the same old way, with the same old annoyances, troubles and kicks bound to recur.

Instead of a faulty and poor service line why not anticipate the complaints which are sure to come, and equip your line with

### Andrae Condensers

By their use such things as "listening in" and the breaking of the circuit by leaving receivers off their holders, are made impossible.

We have a standing offer to equip an entire line on trial and will pay return charges if you say they're not as represented.

### Andrae Telephones Never Disappoint

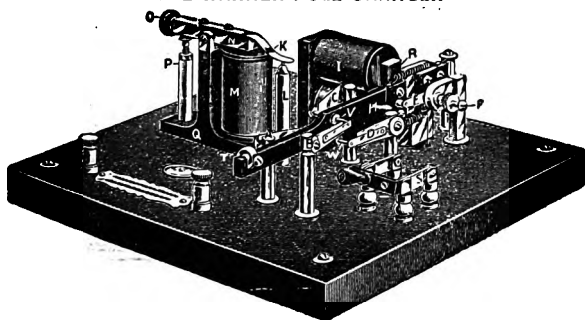
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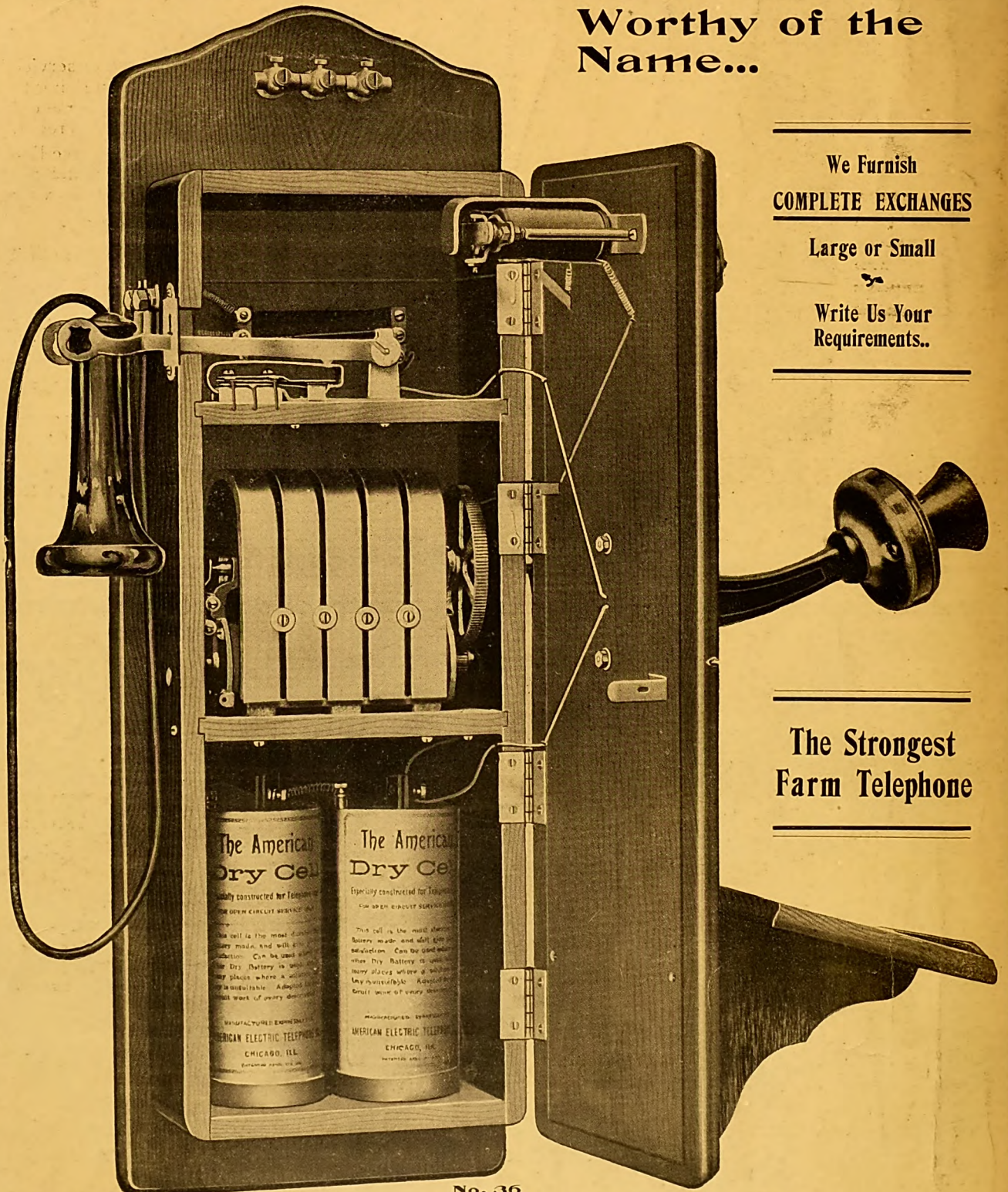
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# SOUND WAVES

VOL. XI.  
No. 6

AN ADVOCATE OF  
INDEPENDENT TELEPHONY

MAY  
1906

Published Monthly by THE THOMAS H. WILSON CO., Logansport, Indiana

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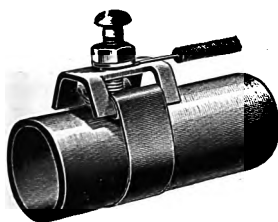


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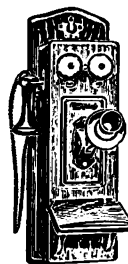
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# SOUND WAVES

A Monthly Magazine Devoted to the Interests of Independent Telephony

Vol. XI.

MAY, 1906

No. 6

## SOUND WAVES

PUBLISHED MONTHLY AT LOGANSPORT, IND., U. S. A. PRICE FIFTY CENTS A YEAR

Entered as second-class matter July 14, 1903, at the Post Office at Logansport, Indiana, under Act of Congress of March 3, 1879.

The Theo. H. Wilson Co., Logansport, Indiana, Proprietors and Publishers

W. A. TAYLOR, Technical Editor. 1362 Monadnock Bldg., Chicago  
F. M. BAILEY, Manager. 1362 Monadnock Bldg., Chicago

Telephone, Logansport Office, Black 441

Telephone, Chicago Office, Harrison 1521, Chicago Telephone Co.  
Telephone, Chicago Office, 2904, Illinois Telephone Co. (Automatic)

## SUBSCRIPTIONS

One Year, United States and Canada	\$ .50
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**New Advertisements** can be inserted if received by the 5th of each month, but to insure proper classification they should be in this office by the 1st.

To mail the paper promptly, it is necessary for us to adhere strictly to the above, and we will appreciate the co-operation of advertisers.

**Subscriptions, Etc.**—Address the Logansport Office. In sending personal checks for books or subscriptions, include 15 cents for exchange.

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## EDITORIAL COMMENT

All communications to the advertising department of this paper should be sent to the Chicago office, addressed plainly to **SOUND WAVES**, 1362 Monadnock Bldg., Chicago, Ill. All communications to editorial department, answers to want advertisements, subscriptions, etc., address **SOUND WAVES**, Logansport, Ind. Subscribers and others will confer a favor and facilitate the work of this paper by complying with the above request. Technical and news contributions will receive prompt attention and are respectfully solicited.

## THE CHICAGO TELEPHONE SITUATION,

It seems that the Chicago Telephone Company has at last reached the situation where it is necessary they should try and explain how it happened. During the past month the city council has been investigating the company and have received a great deal of gratuitous advice both from the people who have had to suffer and from the telephone company itself. A day was set apart for hearing the complaints from the subscribers. The results were somewhat surprising. There were so many who thought that the rates and service were satisfactory, that appearances were that the company had seen the witnesses first.

The labor unions have taken up the fight against the company, not because there is any objection against the service or that there is any kick against the charges; but because the telephone directory is printed by a firm that does not employ union printers.

Recently there have been applications from at least three companies who ask for franchises. These companies offer the most astonishing concessions to the city. In one case especially, the applicant would have one to believe, that the telephone business was pretty nearly all profit. Of course at such times there are always some men who seek cheap notoriety, men who never saw the inside of a telephone exchange, and who would tell an experienced engineer just what it costs to run a system and how much money can be made.

Of all the applicants the Illinois Manufacturers Association has made the greatest impression and have apparently scared the telephone company into making concessions.

The association claims to be in position to invest the sum of \$6,000,000.00 in a telephone exchange. It is their object to offer the service at practically cost. They will take only 6 per cent as interest on the investment. They offer the city any fair proposition in the way of compensation that the city wishes to make. The Manufacturers Association evidently means business and if one can judge from past experience they are in position to make good. It was this association that fought the company to a finish on the charge of \$175.00 for telephone service and won the case. If there is any body of men that are in position to do what they say it is that organization.

Since this franchise has been asked, the telephone company has made what they call a very material reduction in their rates.

The last offer of the Chicago Telephone Company is as follows:

"1. As soon as it is physically possible, the company will abolish the ten party line residence service and substitute therefor the four party line service, charging for the four party line service the same rate which is now charged for the ten party line service.

"2. It will reduce the cost of residence telephones, unlimited service, single party line, from \$100 per year to \$75 per year; two party lines from \$75 per year to \$60 per year; and change all four party residence lines to two party residence lines. This will involve a reduction in the company's revenue of \$59,838.

"3. The reduction in the rate of desk telephones to \$1 per month. The present rate for business extensions is \$30 per year; residence \$15 per year. It will make the charge uniform of \$1 per month, making an annual reduction in revenue of \$58,029.

"4. The publication in the directory of three names free for each subscriber having a telephone; now only one name is free, and the charge is \$10 annually for each additional name. This makes a reduction of \$22,640.

#### CUTS INTO THE INCOME.

"These changes will reduce the annual income of the company \$140,507. The reduction in rates heretofore proposed and now pending before the committee is \$797,094, making the total annual reduction \$937,601.

"The cost of additional plant to change the classes of service above outlined is \$1,495,000. Increase in annual expense of maintenance and operation is \$198,000. Total reduction of revenue and increased annual expense is \$1,135,601.

"Effect of these changes by the schedule as now proposed: 24,440 residences will be changed from ten to four party lines; 9,138 ten party business telephones will be changed to two party lines; 16,188 four party telephones will be advanced to two party service, and the rates on 6,675 extension telephones will be reduced to \$12 per annum."

There is a considerable amount of expense involved in the change from the ten party line system to that of the four party line. There will have to be five lines where there are now two, and the switchboards will have to be correspondingly larger.

If, therefore, the company can make a profit on the four-party line at the same price that they charged for the ten party line, what must have been the returns before the change?

For the benefit of our readers we will say that the company received a minimum of five cents a day per telephone or fifty cents per day for the whole line. As each message was charged for at the rate of five cents (prepaid) one can imagine how much was taken in. It is a mighty quiet telephone that is not good for more than one message a day.

The company is very magnanimous (?) in their offer of reductions on extension telephones from 300 per cent profit to 100 per cent, and in their offer to allow three free names in the directory.

In the meantime the city has been examining the books of the company and have found some interesting figures showing how the company is inclined to juggle their accounts.

One item to the amount of \$269,884 was found, for which the company refuses to produce the vouchers. Of course the money may have been spent legitimately, but when a company allows free access to their books and then holds back certain items there is a suspicion in the minds of all, that there may be the trail of the "yellow dog" somewhere.

According to the auditors making the examination it would appear that the telephone company has juggled the

figures to make it appear that the earnings have been \$1,000,000 less than they have actually been.

The company figures its earnings for the year 1905 as follows:

Average investment .....	\$17,059,617
Net earnings .....	1,626,811
Percentage of profit .....	9.54

But the experts of the city figure the profits thus:

Net earnings .....	\$ 1,626,811
thirty-five items for which vouchers were re-	
fused .....	269,884
Reserved for insurance .....	150,000
Royalties or rentals to the Bell Company...	305,000
Reserve for litigation .....	275,000
Actual profits .....	\$ 2,626,695
Average investment .....	17,059,617
Less reserve for deferred main-	
tenance .....	1,276,391

Actual investment .....	\$15,783,225
Percentage of actual profits on actual investment....	16,

Nobody can doubt but that the plant of the company can be built for much less than fifteen million dollars. When it is taken into consideration that the Bell Telephone Company dictates to the Chicago Company and that the Chicago company must buy practically all their supplies from the Western Electric Company at Bell prices, it can be easily understood. Several years ago there was a stock dividend of one million dollars which of course went to increase the capital. It is safe to say that all the physical assets of the company can be reproduced at a cost not to exceed ten million dollars. It is an old old scheme of the Bell company to hide the profits by greatly increasing the stock.

The only fair way to ascertain the value of the exchange, would be to have it appraised by a committee of competent engineers, not on a basis of what the Chicago Telephone Company paid for it, but on a basis of a new plant bought from companies having competition.

It certainly looks as though there is certain relief in sight and that the long suffering subscribers will not have long to wait.

From various parts of the country comes the report that the Bell company by accredited representatives acknowledge defeat and are willing to quit or make combinations that will eventually mean a merging of the Independent interests with theirs. Such a proposition, it is said, was recently made at Wabash, Indiana, as well as at numerous other places. In detail, this alleged submission, was to the effect that if the Home company would cut the Bell toll lines into the Home exchange and handle the toll business of the Bell, the Home company to receive a handsome share of the profits as a compensation for so doing that the Bell would close its exchange there leaving the Independent company in undisputed possession of the field.

The proposition was promptly turned down by the manager of the Independent company for the reason that from the start he has been averse to any modification of the original intentions of his company—that of being independent and utterly devoid of any connection with the big corporation.

As usual after this failure to connect with the Inde-

pendent company it was announced through the columns of the daily press that improvements would commence at once on the Bell plant and that business would be sought after in a more strenuous manner than ever before. All this appeared as a joke to the Home company stockholders as such threats are of common occurrence and amount to little even if the Bell would rebuild and renew the fight.

This is a case which should be an object lesson to every Independent telephone man in the country. Flattering offers of this kind are made simply to get in touch with the Independent interests, to learn more of our methods of doing business, more of how we propose to conduct the fight in the future and in the end through some flaw in the contract to back down and out of the proposition apparently made in good faith by the Bell.

There is only one thing to do—one way of winning this struggle and that is to stick to the text "be independent" in every sense that the term implies. Now is the time to continue the fight, not a day passing but some reports come in of victory. Look at the Chicago situation and consider that even though it took years to do it, that now the Bell will have to knuckle down and take its medicine. The money that was torn from the pockets of its subscribers will have to be returned as will also the thousands of dollars and interest that the company illegally took from the city. They have had a long run for their money but the jig's up now.

### Milwaukee Situation.

At the present writing the Milwaukee council has passed favorable on the application for a franchise by the Farnsworth-Bills Company, of Chicago. The vote was 39 to 2, there being at the time five aldermen absent from the meeting. The matter is now before Mayor Rose and will doubtless meet with his approval. In case, however, it is vetoed, the necessary 34 votes to pass it over a veto, have been secured.

In addition to a complete and up-to-date underground cable system in Milwaukee, with a total expenditure approximating \$3,000,000, the company have well-matured plans for developing toll lines throughout the state. This will have them well prepared to connect with Chicago when the opportunity comes. Every effort is being made by several parties, and by all means available, to gain a foothold here with bright prospects.

### Letter From President Hoge

The Iowa Independent Telephone Association, S. S. Lichty, President; Chas. C. Deering, Secretary, Des Moines, Iowa:

Dear Sirs:—On behalf of the National Interstate Telephone Association, I wish to extend a cordial greeting to the Independent telephone men attending your meeting at Des Moines.

Judging from the programme, of which I have received a copy, you will have a most interesting meeting and I sincerely regret that conditions are such, it will be impossible for me to attend in person as I had hoped to do. Your programme seems to be very well balanced and takes in a variety of subjects which cannot fail to interest the Independents of your state.

I am going to ask, although the request may seem a little trite, that you devote some time to the discussion of the Standard toll sign and the importance of every Independent company displaying these and also using the "Shield" on directory covers and other printed matter.

The work was only begun when a Standard toll sign was adopted for the use of all of the Independents throughout the United States. To make it mean anything, we must rouse up an enthusiasm for the emblem to display it on all occasions. In no

other way can we expect to educate the public to the significance of the "Shield" as the Independent emblem.

Also call the attention of your members to the importance of giving us their hearty co-operation in preparing our toll line maps. While a number of the Independent companies of Iowa have already sent us a sketch of their toll lines, there are still many to be heard from, and every day's delay is adding to the cost of this work. Tell them not to wait until we make a formal written request for map data, but to send it to us now.

A good way to bring this and the matter of Standard toll signs to the attention of the meeting would be to have some member introduce a resolution that all companies who are not at present displaying the toll sign, will arrange to do so within, say ten to thirty days, and another resolution providing that all companies who operate toll lines and have not furnished us a sketch of same will send this in at once. This will emphasize the importance of attending to these matters. \* \* \*

In discussing "Tactics of the Opposition," it might not be amiss to call attention to the plans which the Bell company in Maine is endeavoring to carry out. They have re-organized their company are trying to sell stock at \$10.00 per share to the Independent people of Aroostook County, agreeing to let them hold a controlling interest by allowing them to purchase 51 per cent of the stock so that they will have the management in their own hands. This is quite a tribute of the strength of the Independent interests when it is considered that only a few years ago the Bell absolutely refused to make any connections whatever with rural companies or assist in any way to develop their territory.

Of course, it is not to be expected that the Bell are making their offer in good faith, their object undoubtedly is to get Independents tied up with them for a number of years under long term contracts and in some way or another they will arrange to keep control of the majority of the stock and will operate the plants in such a way as to make the stock worthless thus freezing out the smaller holders. When they have the situation in their own hands again they will go back to their same old tactics of charging whatever they like for any kind of service they care to furnish, and having the people bound by contracts extending over a number of years they will be unable to secure any relief. There is not much danger of the Independents of Maine being "hoodwinked" into an alliance with the Bell even though their proposition at first sight might look attractive.

I am calling your attention to this so that you can warn the Independents of Iowa in case a similar proposition should be sprung on them, as undoubtedly our opponents will not confine tactics of this sort to any one locality, but will undoubtedly use the same "bait for suckers wherever the fishing seems to be good."

At a number of places in Indiana some of the Independent companies had contracts for toll line connection with the Bell, but in accordance with resolutions passed at recent meetings such companies are severing their connections as fast as their contracts expire, and where contracts give no special period, connections are being broken off at a very short notice. In case any of the Independents in Iowa have such contracts the wisest course to pursue will be to get out of them as soon as possible. \* \* \*

The Independents of Iowa are to be congratulated upon the progress made during the past year and the achievements of the next twelve months will undoubtedly eclipse all past records.

Reports which we are constantly receiving from all over the country indicate great activity in the Independent field and show a tendency for closer organization among the Independent interests. That the need for thorough organization is being appreciated as never before, is proven by the various State organizations which have been formed since June last and by the steps which are being taken by several of the States which at present have no Association to be thoroughly organized in time for representation at the next National Convention. Organization among the Independent interests is going hand in hand with extensive improvements in existing systems and a wide development of new territory. The prospects for Independent Telephony were never so bright as at present and we may look for an unprecedented growth during the remainder of this year.

I should like to call your attention now to the necessity of electing your delegates to the next convention which as you know, will be held some time in June. It was originally intended to hold this convention at St. Louis but for a number of reasons, it has since been decided advisable to make Chicago the meeting place this year. \* \* \*



# Exchange Operation for Profit

In the past, the Independent telephone systems have been running most too much for the "Dear public," and they have found, for the most part, that it does not pay overly much. It is, of course, well to give good service, but when it comes to the giving of service at a loss, the operator must reform in some manner.

The question of the increase of the rates has been thrashed out to a finish. The subscriber who does not use the telephone very much is certainly going to register a great "kick." Of course the raising of the rates will put the exchange on a paying basis if the subscribers will stand for it. In very many cases it is well to make an increase, but in such a case, some method must be adopted which will appease the user who cannot or will not stand the increase.

There are two ways of taking care of such persons. One way is to put in party lines, and the other is to introduce measured service. A combination of these two ways may also be adopted.

The party line method has been discussed in these columns on many occasions, and it is conceded by most exchange owners to be the best money making arrangement that has been tried. There are many still who are afraid to try the change. In some cases selective signaling party lines have been adopted and have been abandoned because of the claim that they are not a success. In other cases the same system has been tried and has been a great success. Of course such systems need a little more skill to keep in running order but there is no good reason why excellent service should not be rendered.

Residence lines need not be private. There is little danger of two parties wishing to use the line at the same time. The chances are that on an average the telephone in a residence will not be used to exceed five times a day. Each time it is used, the line will not be occupied more than three minutes at the outside. Therefore with four on a line the total occupation will not exceed one hour per day. The investment will even then be idle for a great length of time. It is very possible that twelve may be placed on the line with great success using the selective system with four combinations. There would not be great multiplicity of rings, three rings being the limit. There are a great many subscribers who would use the telephone if they could get the service cheap enough; with twelve on a line in a city or village extremely cheap service can be given.

The Bell company is having its best success in the party line business. In Chicago nearly all their growth comes from the four party selective and the ten party partial selective system. The parties on rural lines are very well satisfied with a large number of instruments on a line and from the users standpoint, there is no reason why the infrequent user in the city should not be satisfied with the same service if he can get it sufficiently cheap.

An exchange who can make money by charging twenty-four dollars a year for individual lines can make more money with four party lines at eighteen dollars and ten party lines at twelve dollars. The gross returns in the first case are twenty-four dollars, in the second case

seventy-two dollars and in the third case one hundred and twenty dollars. The extra investment for the four party line over that of the individual is not to exceed forty dollars and in the ten party line the extra investment is about one hundred and twenty dollars. Suppose the total cost of the individual line is forty dollars, then the four party line will cost eighty dollars, and the ten party line one hundred sixty dollars. We then have the following:

Individual line—Cost per telephone \$40.00; gross income, \$24.00.

Four party line—Cost per telephone \$20.00; gross income \$18.00.

Ten party line—Cost per telephone \$16.00; gross income \$12.00.

The cost of taking care of the trouble on the line is some more in a party line system, but when this expense is divided between the telephones the proportion allotted to each instrument is greatly smaller than that which is charged against the individual line instrument.

Most Independent companies have fought shy of the party line proposition in city exchanges because they have made their way against the Bell company largely because of the individual line service. They are inclined to think that their friends will go back upon them and that they will hear the sarcastic "I told you so" from their friends (?), the Bell Company. There need be no hesitation on that score, for the service will still be much lower in cost than that which the Bell Company was willing to charge in the days when the Independent company started into business.

How about measured service? Some may consider the following statements as heretical, but it might be well to consider them carefully before criticising them.

In the first place we will ask, is telephone service worth more to the man who uses his telephone fifty times a day, than to the man who uses it ten times a day? We think that no fair minded man will deny that the service is worth more to the subscriber who uses his instrument the most. There has been some effort to discriminate in the charges for service by charging the business man more than the residence user. But how about the business men who have different volumes of business to transact over the wire? Is not the infrequent use entitled to a lower rate? We should say that he certainly should be charged according to the amount of service which he receives.

Does it not therefore seem more fair to charge exactly according to the amount of service rendered? Of course there must be some minimum charge based upon the fixed expenses of the system but it seems just and right to charge for each and every call sent over the line.

The charge per call may be regulated according to a sliding scale, which will decrease as the number of calls increase, and in that way make the total expense for a very busy line much less, at the same time acting as a premium for increasing the use of the instruments.

A measured service will decrease useless conversations and thus reduce the operating expense at the central office. In the case of party lines the trouble from inter-

ference between parties who wish to use the line at the same time, will be diminished.

Electric light and gas companies found out years ago that there could be no economy in flat rate service, and they had to abandon it in order to exist. It will be the same way with telephone service. Sharp competition will force the companies to adopt every business-like measure that will increase their earning power and at the same time not interfere with the efficiency of the service.

Measured service will surely entirely displace unlimited service, and the day is not far in the future when the change will be accomplished. The telephone exchange is just as surely a business proposition as the banking business or that of manufacturing, and the business that is run on lines of approved business methods, will be the one that survives heart breaking competition.

### **An English View of Telephone Progress.**

The Electrical Magazine (English) for January gives some information showing the relative progress of telephony in America and England. It states that in the whole of the British system, both of the National companies, there are probably not to exceed 100,000 telephones. This will come as a surprise to many of the readers in the United States where there are several cities where there are more than that number. The magazine states that in the United States in the year 1902 there were 2,300,000 telephones, the number having grown from 276,000 in ten years. We are inclined to think that the figures given are the Bell official figures and that the figures from the Independent companies were entirely overlooked.

They also mention the "Televue" whereby one may be enabled to see over the line. The description of this invention (?) was given in the columns of this magazine. Unfortunately the inventor has not been heard from since the article and we are very much afraid that the world has lost another revolutionary discovery.

It is hard to understand why the English public has not taken more kindly to the telephone, unless there has been no competition to stimulate progress. In this country, competition has no doubt been at the bottom of the extremely rapid growth of the art during the past ten years. Before the time of the advent of the Independent companies, the Bell company made practically no effort to increase its business. They were getting high rates and were not willing to give the cheaper class of service. Even their inventions of the most value were kept in the back ground in order that no expense might be spared to give poor service.

The following is part of the article from the magazine:

In direct contrast to wireless telegraphy the development and application of the telephone has been phenomenal. To give figures in a case like this does not adequately convey the degree of progress achieved, though in this regard it may be said that between 1892 and 1902 the telephones in the United States had increased from 276,360 to 2,315,297. It could be safely said that this number in the succeeding four years will have doubled, though we have not the figures to quote. In the British Postoffice system in 1905 there were 48,118 telephones, while the National Telephone Company's figures must exceed these very considerably. Telephones are now becoming household necessities, and it only needs reduced

rates and cheap manufacture to bring this form of communication within the reach of all.

The central battery system is the standard for all new exchanges, and it is found in practice to give excellent results. Lamp signals at the board are also the rule rather than the exception, and magneto calling is giving place to the simple signal sent when lifting the receiver from its rest or hook. The manufacturing side of the industry has received particular attention, and special machinery is now employed which reduces the production of parts to automatic methods, and materially lowers the cost of manufacture. The actual cost of fabrication can in fact become a fixed quantity, any variation in the selling price being due to fluctuation in the raw material market. As a whole, telephone practice is now conducted on standard lines, and such improvements as are effected relate to minor details of instruments and exchange apparatus.

Automatic telephony, which seems the aim and object of telephone engineers, while it may also be vaguely considered desirable by the public, is being fostered rather more in America than any other country. During the year several large exchanges have been erected—their capacity being about 10,000 lines—in several Canadian and American towns, and, according to the organs of the industry, are giving complete satisfaction. Published figures attribute to one installation a saving of £6000 due to automatic operation, and in another case a dividend of 13 per cent. was paid by a small company using an automatic exchange. At Los Angeles an automatic service for extensions was recently installed and the management are so satisfied that the work of converting the entire exchange is being undertaken. The total capacity is 100,000 lines, and at present half these are in operation, so that the system will be of no mean dimensions for automatic working when completed. It is announced that automatic systems will shortly be introduced into this country.

A statement made in an American Telephone contemporary would encourage the belief that an instrument for making it possible to see the person conversed with at the telephone had been invented and was found to be successful. The inventor objected to disclosing details, as his patent rights had not been taken out. During the coming year we may hear something more of this attachment, which is known as the "Televue."

### **Meeting of the National Inter-State Association.**

The next meeting of the National Inter-State Telephone Association, will be held at the Auditorium hotel, Chicago, June 26, 27 and 28. The committees meet on the 25th. It was originally intended to hold this convention in St. Louis, and the announcements were made to that effect by authority of the executive committee at the request of many prominent telephone men, but as the Kinloch Telephone Company will be cutting over to their new switchboard, just at the time the convention will be in progress, the place of meeting was changed to Chicago, with the expectation of holding it in St. Louis in 1907. The selection of delegates to attend this convention, should be made by those who have not already done so, at once, and the names of those so authorized, should be forwarded to the secretary of the National Association, 708 Electric Building, Cleveland, Ohio.

## President Hoge's Address at Columbus

This talk on "National Development and Progress of the National Inter-State Telephone Association" must of necessity be somewhat disconnected and of a statistical nature. I have had prepared a general outline map of the United States, showing the principal trunk lines of the Independent system. We have made no attempt at showing the many hundred thousands of miles of wire that are being used to-day, for handling messages between local points and as feeders to these principal trunk lines. The three blue prints shown here to-day are the National Inter-State Telephone association's map of Ohio, Indiana and Michigan. The map of Ohio shows approximately 90 per cent; the map of Indiana approximately 75 per cent, and the map of Michigan approximately 85 per cent of the development. It is almost impossible to get the necessary data from some of the companies to complete these maps on a satisfactory basis. The National Inter-State Telephone Association's map maker is instructed not to put any lines on the map that are not properly certified to and vouched for by bona fide Independent people.

We have divided the lines into two classes: Class "A" being copper metallic lines of No. 10, 8 and 6 wires, class "B" being iron and No. 12 and 14 copper. There are approximately 3,200,000 Independent telephones working to-day. There has been expended on the development of the Independent movement approximately \$300,000,000 in cash. \* \* \* \* \*

The standard form of advertising is being used by the Independent companies in thirty-seven States. Ohio companies have purchased over 2,000 signs. A number of new State associations have been formed during the past year, among them being New Hampshire, Vermont, Oregon, Arkansas, Oklahoma and Indian Territory. It is interesting to note how rapidly the few remaining cities of consequence are being picked up by the various Independent interests so as to complete the system. A franchise has recently been taken up in Detroit by our friends Messrs. Brailey and Woodbury, and their associates from Toledo and St. Louis and New York City, and by the United States Independent Telephone Company, franchise at Spokane, Wash., and Portland, Ore., and a large number of towns and cities of less importance in those States by Charles E. Sumner. Franchises are pending in Milwaukee, Wis., San Francisco, Cal., Cincinnati, Ohio, Evansville, Ind., Nashville, Tenn., and a number of cities in New England. It will be of interest to note that there is quite a development in New England at the present time. The people of that section of the country have been led by our opponents, who have been especially strong around Boston, to believe that there was no such a thing as an Independent system.

The flood tide of the Independent development has so thoroughly covered the central west and Pacific slope that it is impossible to hold it back longer from the eastern coast.

The development in Cleveland during the past two years has shown an average of 500 telephones per month; contracts received so far this month by the Cleveland company show a continued growth at the rate of 1,000 per month. The Columbus Citizens Company is growing at the rate of 500 per month. The Frontier company at

Buffalo is gaining at the rate of from 500 to 750 per month. Philadelphia is showing a development of over 1,000 per month. The state of Texas is having an unusual growth. The Missouri Independent companies have had somewhat similar experience to what the Michigan Independents had some six years ago. Our competitors purchased six exchange properties during the past year and in three cases the cities have granted new franchises and plants are now being built, and other cities and villages are ready to grant franchises.

The development on the Pacific Coast is very marked; they have a development there equivalent to one telephone to every five people in many of the cities and towns. Large office buildings have been built by a number of the Independent companies. Two notable cases are those at St. Louis and Wheeling. Also note that there is now a heavy copper line from Albany, N. Y., Baltimore, Md., and Philadelphia, Pa., to points west and south of Kansas City, with branches leading to Michigan, Minnesota, Kentucky, and Southern Missouri. The possibilities of the trans-continental lines will be apparent to every one. We are so accustomed to seeing big things accomplished that we are likely to forget conditions as they existed ten years or more ago. If you should have addressed an intelligent audience like this ten years ago and have told them that the Independent companies would have 3,000,000 telephones in operation on March 29, 1906, you would have been regarded as a fit subject for an insane asylum.

The success of this development has been due to the fact that over 6,000 operating companies have each been developing their respective territories and in fully seventy-five per cent the development has been intelligent, with a view to making a comprehensive system.

I cannot help but feel that the National Inter-State Association with its state and district organizations affiliated is responsible to a very great extent for the systematic way in which the work is being carried on at the present time. Telephone development in the rural districts (and 85 per cent of this development belongs to the Independent system), have brought the citizens of the farm, the village, the town and the city all in close touch with each other, their subscribers are better equipped to do business with each other than ever before in the history of this country. There is not the waste of time driving back and forth, neither is there the waste as under the old system from over-loaded markets. This results in the farmer getting better prices for his products, the merchant in the city being able to handle fresh and wholesome food at fair profits. It enables those living in the country to keep in close touch with the markets. A notable case in New Jersey between two towns, a distance of five miles apart, there are twenty-seven farm houses, twenty-six are equipped with telephones. It has advanced the value of farmland and enabled the farmer to keep as near up-to-date as his city neighbor.

The public in general are seeking information of the Independent telephone movement. The Atlantic Monthly for the month of February, published an article written by Mr. Jesse Weik, of Indiana. This article was reviewed at some length by the "Review of Reviews" in March issue, and a very substantial editorial on the same subject in "Everybody's" April number; "Success" commenced

the publication of a series of articles in the February number which has been continued in the March and April numbers and will continue during May and June, all of which are being read with interest.

Efforts have been made to complete the long distance lines on the Pacific coast; that is, in connecting all possible points west of the Rocky mountains. The development around St. Paul, Minneapolis, Duluth and other points northwest is very marked. Over 75,000 telephones are now connected with that system. There will undoubtedly be a trunk line built across the mountains connecting the Pacific slope with the central west within the next few years. The development in the State of Utah is extensive, extending as it does through the agricultural and mining districts of that State.

I have not touched on the development of the south, east of the Mississippi river for the reason, I understand that Mr. Barber, president of the largest company in the south, whom every one welcomes as a member of our association, is to be here to talk on the development of that section of the country.

The development of lines between small cities will show equally as great in a majority of the other States as they will in Ohio, Indiana and Michigan. The National Inter-State Association hopes to have maps pre-

pared of a large number of the States, by the time the National convention is held in Chicago, in June next. Our success in this matter, however, will depend largely upon the cooperation we receive from the operating companies in the several States.

We find the companies all over the country with few exceptions, standing loyally by their associates. We have hundreds of applications for information on numerous subjects of importance to each community.

We are trying to get the few remaining places built by getting the different companies to extend their service so as to fill in the gaps not yet taken care of. The outlook is most encouraging; more new money is going into the Independent movement this year than there has been in any two years in the history of the business.

The securities are very much better regarded to-day than at any time in the past.

There is no question about the business becoming better organized each year. We have made marked progress all over the country during the past year and every one who has studied "The Ohio Plan" are well pleased with the same.

[Delivered at the meeting of the Ohio Independent Telephone Association at Columbus, Ohio, March 29.]

## The Indiana Outlook

BY WM. L. MOELLER

Indiana has to-day 190,000 Independent telephones—the Bell has 35,000. If the Independents in Indiana have been able to do this in ten years, under the difficulties formerly existing the results in the next five years will be still more emphatic.

In Fort Wayne the Home Company has 3700 telephones with an average net gain of seventy-five per month—the Bell has a grand total of 350 with an average net loss of 10 per month. The Home Company has just contracted for the purchase of the property of National Telephone & Telegraph Company with its thousand miles of toll lines, and exchanges at Sturgis, Mich., Auburn, Ind., Kendalville, Ind., and New Haven, Ind. and has also provided for the sum of \$100,000 to be used in extending the toll line system.

The securities issued by the Home Company are readily absorbed by home people at a premium, thus indicating the regard in which the property is held among its citizens. The South Bend Company has made a splendid record and now counts, with its Mishawaka exchange, 4000 telephones. There seems to be a promise of early toll connection with Chicago over the lines of the South Bend Company; Lafayette, Ind., is preparing for a general reconstruction of its plant, they now count about 2700 subscribers. Logansport is flourishing and has the field to itself, and this list might be continued indefinitely. The facts are that the outlook in Indiana is exceedingly bright. To emphasize this I herewith copy the following from the Bulletin of our state association which gives a fair indication of this year's outlook:

"The year 1906 will witness the greatest development in the history of the Independent telephone movement.

As Indiana already leads in the number of telephones per capita, so will this state lead in the extension and

development of telephone service during the present year. The New Long Distance Telephone Company is already extending new circuits to Logansport, Tipton, Elwood and other cities in the central northern part of the state, and its present estimates provide for additional pole lines and circuits that will carry its wires to all parts of the state, involving an outlay of more than \$500,000. The Indianapolis Telephone Co., has applied to the city for a new franchise, which if granted, means the extension of its present system of 12,000 subscribers to one of 20,000 capacity. At Marion a franchise has been granted for an Independent exchange, and plans are already under way for the construction of a modern telephone system in that city and Grant county. At Terre Haute the Citizens Telephone Company is erecting a new building and extending its underground wires, as a part of its plans to double the capacity during the coming year. At Columbus, the Citizens Telephone Company, which has 1200 subscribers and gives service to a total of 2200 in Bartholomew county, advanced its rates January 1st to \$30.00 per year for business and \$20 per year for residence telephones. Regardless of the activity of the Bell at this juncture, the Citizens Company did not have a net loss of one subscriber. The North Vernon & Vernon Telephone Company of North Vernon, will spend \$15,000 during the year in extensions and enlarging its capacity. The Fountain Telephone Company of Covington, will install a new 500-capacity central energy switchboard and change its magneto to a common battery system. Bids have already been asked for this new equipment. The LaFayette Telephone Company of LaFayette is spending \$150,000 in placing its wires underground and erecting a new building. This work is already under way. At Spencer, where the Mugg Telephone Company went out of busi-



ness and its few subscribers were taken over by the Central Union Telephone Company, the New Long Distance Telephone Co. has been granted a franchise to install a local exchange, and work will be begun at once. At Frankfort, where the Bell purchased a gold brick last summer and where the Central Union Telephone Company has abandoned its own exchange and taken charge of the Central Energy Telephone Company, the New Long Distance Telephone Co. has been granted a franchise and will begin at once to install a new system. The Mutual Telephone Company of Shelbyville, is considering bids on estimates amounting to \$40,000, which includes changing its present magneto to a full common battery system.

In general, supply men who travel the State say the present prospects indicate that Indiana will spend more money in Independent telephone equipment during the present year than last, when over \$4,000,000 was invested, and that their January sales have been the best since they began canvassing the Indiana field."

It is only a question of a short time when the territory of the United Telephone Company, which was purchased by the Bell a year ago, will have new up-to-date Independent exchanges; steps in this direction are now in progress.

Our state organization is doing grand work—it is cementing into a close union all Independent state interests and every company is lending its active support towards making it a big success. The state has been divided into thirteen districts, and practically all districts are now well organized so that from this time on the purpose of the association of promoting a uniform system of constructing, maintaining, operating and accounting, can and will be made a living fact. Our association was organized at Winona, Ind., July 12, 1905—we are quite young in years but strong in purpose and numbers and will stand shoulder to shoulder with you in the good work. Our state meeting will occur at Indianapolis May 17th and a cordial invitation is extended to all Michigan brothers to be with us.

[Delivered at a recent meeting of Independent Telephone men at Ann Arbor, Michigan. Mr. Moellering is manager of the Home Telephone Company, Fort Wayne, Indiana.]

M. Millhollin succeeded F. H. Stacey as manager of the Rural Telephone Company, Anita, Iowa, the first of the year. The equipment is in excellent condition giving very satisfactory service to more than 350 subscribers on its town and country lines. It is one of those fortunate companies whose satisfied subscribers do the soliciting so that its territory is well covered.

Mr. C. E. Ward, general manager, Missouri River Telephone Company, Geddes, South Dakota, passed through Chicago recently returning home by way of Des Moines. He reports South Dakota in prosperous condition and spoke of a number of proposed extensions and new installations. The good crops enjoyed by the state has brought about an unusual growth in the demand for telephones.

The Mt. Pleasant Telephone Company, Mt. Pleasant, Iowa, report a very prosperous condition indeed. They have prospered to such an extent since their installation that they now have over 900 subscribers with practically no competition, as the Bell has less than 10, being no more than a toll station. Of this number 550 'phones are in the

city which is a ratio of approximately 1 to 7, leaving still some room for growth. They have \$52,400 paid on a capitalization of \$700,000, and are paying 10 per cent on preferred stock and 5 per cent on the common, thus keeping their stockholders well pleased, and at the same time laying aside a fund for depreciation.

The Dunwich and Dutton Telephone Association of Dutton, Ont., has been formed with W. A. Galbraith as president.

### Ohio Independent Telephone Association March 29th, 1906.

Representatives in attendance from the manufacturing and supply houses at the annual convention, Columbus, O.:

Arthur A. Anderson, Standard Cndg. Cable Co., Pittsburg, Pa.; W. W. Affleck, John A. Roebling's & Sons Co., Cleveland, O.; H. E. Adams, W. G. Nagle Elec. Co., Toledo, O.

A. E. Barker, Dean Elec. Co., Elyria, O.; W. P. Bowman, John A. Roebling's Sons Co., Cleveland, O.; Gustav F. C. Baun, Century Tel. Con. Co., Buffalo, N. Y.; Wm. M. Bruce, Select Tel. Mfg. Co., Springfield, O.; J. W. Brooks, John A. Roebling's Sons Co., Cleveland, O.

Al I. Carney, W. G. Nagle Co., Toledo, O.; V. A. Chapman, Mich. Elec. Specialty Co., Muskegon, Mich.; J. F. Crook, Automatic Elec. Co., Chicago, Ill.; A. B. Crawford, Stromberg Carlson Co., Rochester, N. Y.

P. J. Eubanks, American Elec. Tel. Co., Chicago, Ill. F. L. Finch, Charleston Electric Co., Charleston, W. Va.; John F. Frasher, Mountain State Elec. Co., Wheeling, W. Va. Harry S. Grant, Century Tel. Con. Co., Buffalo, N. Y.

C. M. Hamilton, The F. Bissell Co., Toledo, O.; J. W. Harris, Baird Mfg. Co., Chicago, Ill.; Wm. A. Hopkins, Ernor Hopkins Co., Columbus, O.; Wm. F. Hoffman, Select Tel. Mfg. Co., Springfield, O.; C. W. Hunt, Williams Tel. & Sup. Co., Cleveland, O.

J. C. Kelsey, Kellogg Swi. & Sup. Co., Chicago, Ill.; E. T. King, North Electric Co., Cleveland, O.; O. F. Kimmel, Kellogg Swi. & Sup. Co., Chicago, Ill.; Chas. Krutz, F. A. Lawrence Elec. Co., Cincinnati, O.; F. M. Knervim, F. Bissell Co., Toledo, O.

J. V. Latham, Cadiz Elec. Co., Cadiz, O. R. E. Macduff, Jr., Frank B. Cook Co., Chicago, Ill.; C. H. Macklin, Swedish American Tel. Co., Chicago, Ill.; Ray H. Manson, Dean Electric Co., Elyria, O.; J. Robert Miller, Indiana Steel & Wire Co., Muncie, Ind.; F. B. Miller, Miller Anchor Co., Norwalk, O.; R. S. Mueller, Kellogg Swi. & Sup. Co., Chicago, Ill.

E. J. Newton, McIntosh Hdw. Co., Cleveland, O. R. M. Pillars, Kellogg Swi. & Sup. Co., Cleveland, O.; Geo. B. Pratt, North Electric Co., Cleveland, O.; Ernest Paradis, W. G. Nagle Elec. Co., Toledo, O.; A. F. Poole, Mountain State Elec., Wheeling, W. Va., Gary S. Powell, U. S. Com. Register Co., Toledo, O.; Geo. H. Porter, Electric Appliance Co., Chicago, Ill.

Harry P. Rogers, Ernor Hopkins Co., Columbus, O.; M. S. Rosenthal, Rock Island Battery Co., Cincinnati, O.

A. H. Scott, Dean Elec. Co.; Carl Seyler, Hubbard & Co., Pittsburg, Pa.; Evan Shelby, Sterling Elec. Co., Lafayette, Ind.

E. L. VanWinkle, Post Glover Elec. Co. Chas. D. Wilson, Rock Island Battery Co., Cincinnati, O.; C. S. Winston, Kellogg Swi. & Supply Co., Chicago, Ill.; P. J. Williams, Post Glover Elec. Co., Cincinnati, O.

It will cost about \$8,000,000 for the Interstate Telephone & Telegraph Co. to get a foothold in Chicago, but the corporation is determined to get into that city to compete with the Chicago Telephone Co., which now dominates the field. An ordinance giving the company a franchise is now in the hands of a committee of the Chicago council.

The Interstate company has an extensive service in several companies in Illinois outside of Chicago, and operates in the cities of Springfield and Peoria. It has an authorized capital of \$50,000,000 and a bonded indebtedness of \$3,200,000.

C. O. Harris, formerly of Salt Lake City, Utah, passed through Chicago on his way east, stopping to shake hands with his many old-time friends in the telephone business.

## Independents at Des Moines, Iowa

The tenth annual meeting of the Iowa Independent Telephone Association was held at the Chamberlain Hotel, at Des Moines, March 13, 14 and 15. The meeting was called to order the first day by the president, Mr. S. S. Lichty of Waterloo, who immediately appointed the following committee on credentials: Mr. D. M. Griswold, Des Moines; E. H. Martin, Webster City and Mr. F. Fischer, Shenandoah. As the minutes of the last meeting had been printed and promiscuously distributed, that part of the program was omitted. The report of the secretary was received and referred to the auditing committee appointed as follows: Mr. F. M. Boardman, Nevada; Levi Baker, Shenandoah and P. C. Cockerill. Mr. Lichty in his annual address reviewed the work of the association in Iowa and other places, and pointed out the

convention were directors and owners of individual lines.

Dr. Nelson's paper on "Our Friend, the Farmer," was not read on account of the doctor being detained by professional business just at the time when he was ready to start for the convention hall, but a discussion of the subject was started and quite a number took part, including R. A. Walker, W. J. Way, Frank McNally, W. H. Barker, Dr. Graves, S. S. Lichty, E. E. England and Messrs. Baker and Ceryes. This discussion brought out the fact, for the most part that the Independent companies and the small rural lines owned by the farmers, co-operate to the mutual advantages of both, and without serious trouble.

Mr. Geo. T. Hewes, manager of the Independent Telephone Clearing House, extended a cordial and general



DELEGATES AND VISITORS AT DES MOINES MEETING

No. 2—President P. C. HOLDOEGEL.

No. 3—S. S. LICHTY, Retiring President.

No. 1—E. H. MARTIN, Webster City

advantages of the association in general, praising the members for their assistance, and predicted great success for the Independents in their fight with the Bell. He took occasion to strenuously deny a report which had been circulated through the press, to the effect that this meeting of Independent Telephone men was for the purpose of effecting a combination. He declared there was not the slightest foundation for such a report and that he did not see how a combination would be possible, as the members of the association and those attending this

invitation to those present to visit the institution he represented and quite a number did so during the meeting.

Mr. J. H. Smith of Dubuque, president of the Evening Press Association, talked on the subject, "Co-operation Between the Evening Press of the State and Different Telephone Associations in the Matter of Gathering News." The subject was considerably discussed and a committee of three composed of Mr. Geo. T. Hewes, E. H. Martin and D. N. Griswold, were appointed to confer with the Evening Press Association. The plan sug-

gested, is for the companies to send their Iowa news to some central point, where it will be disseminated to the papers which are members of the association and which are agreed to pay the telephone companies for the service. The report of the committee made later is as follows:

Your committee appointed to confer with the Iowa Press Association in convention at the Savery Hotel March 13th, begs to report as a result of our conference with the following representatives and the following papers: Globe Journal, Dubuque, Iowa; Gazette, Cedar Rapids; Courier, Ottumwa; Times,avenport; Journal, Muscatine; Tribune, Sioux City; News, Des Moines; Courier, Waterloo; Republican, Iowa City; Herald, Oskaloosa; Gazette, Burlington; Times and Republican, Marshalltown; Times-Herald, Mason City; Freeman Tribune, Webster City; News, Boone, Iowa, that it is practical, feasible and desirable that arrangements be perfected whereby the Independent Telephone Companies of this state may contribute to the daily gathering of news throughout the State as one of the newspaper representatives states, "rake the state as with a fine tooth comb." It was suggested, in order to consummate the idea in the broadest possible manner that a Central point be secured into which the news gathered during the twenty-four hours shall pour incessantly into the central reservoir. The ideal condition to be realized can be better illustrated by reference to this chart. The central point A being Des Moines. These telephone lines extending throughout the state sub-divided into districts, each toll station or farmers' line transmitting to his central checking station, the events of importance which transpire to be then transmitted by telephone to the headquarters of each district, thence from the district headquarters to the general headquarters at Des Moines over a duplexed telegraph circuit, thence, at a pre-arranged time, each member of the Press Association will be placed in electrical connection with each other and with the Des Moines office. The sending out from this central point (Morse) of all news matter after it has been systematically classified, all of the newspaper offices being in circuit at the same time, will greatly facilitate the business proposed. This committee recommends for your careful consideration, after the acceptance of this report, a committee which shall be a permanent committee, shall be named for the purpose of perfecting the organization of what shall be known as an Independent Telephone Press Bureau, the Iowa Association will, in future development throughout the Independent Telephone interests, not only of the state, but of the several states, shall be known as the IOWA PLAN.

Committee,  
GEO. T. HEWES,  
E. H. MARTIN,  
D. M. GRISWOLD.

A permanent committee was appointed as follows to perfect an organization:

E. H. Martin, president Martin Telephone Company, Webster City; C. H. Smith, secretary and general manager New State Telephone Company, Sioux City; H. A. Kinney, president Woodbine Company, of Woodbine, Iowa; E. E. England, manager Mount Pleasant Telephone Company, Mount Pleasant, Iowa; Geo. T. Hewes, manager Independent Telephone Clearing House, Des Moines, Iowa.

#### THE SECOND DAY.

At the opening of the session Wednesday morning, President Lichty read a letter from President Hoge of the National Inter-State Association, which is of considerable interest to the Independents and is given elsewhere in SOUND WAVES. Mr. H. A. Douglas of Cedar Rapids presented his paper on "The Best Method of Handling Subscriber's Toll Accounts," which was thoroughly discussed by a number of those present.

Mr. R. A. Walker of Iowa Falls, then presented his paper on "Care and Maintenance of Equipment." This paper, also, brought a number to their feet with points that were beneficial, as well as entertaining.

Considerable time was taken up at this session, by discussion over the revision of the Association's Constitu-

tion, especially on a by-law, which provided that all annual meetings should be held at Des Moines. The revision was vigorously opposed by Sioux City members, and was finally amended to read that all meetings would be held at Des Moines, unless otherwise voted by the association.

The Wednesday afternoon session was called to order at 2:30, and a committee composed of E. E. England, of Mt. Pleasant, Mr. Geo. N. Bandy of Des Moines and C. A. Hollis of Hudson, was appointed to visit the exhibitors and ask them to close during the afternoon, which request was readily complied with, and Mr. C. H. Smith of Sioux City then presented his paper on "Better Long Distance Connections," followed by Mr. Geo. N. Bandy's paper on "Toll Service," and "The Clearing House," by Mr. Geo. T. Hewes of Des Moines. These three papers brought Mr. Bellamy to his feet, for the purpose of com-



HOTEL CHAMBERLAIN, DES MOINES.  
Convention Headquarters for the Iowa I. T. A.

plimenting the authors, taking each in its turn, and giving quite an account of the different subjects. This led afterwards to the appointment of a committee of three composed of H. A. Douglas, Geo. N. Bandy and J. C. Thorn to solicit individually every member attending the convention for membership in the Clearing House. During the discussion on matters pertaining to the constitution to be adopted, Mr. Deering's paper on "District Organization," was called for and presented by that gentleman, as the means of enlightening the delegates on certain questions which had arisen.

It was at this session that E. H. Martin of Webster City started the proposed organization of a company with capital of \$250,000 to make and continue the fight with the Bell. Thus throwing down the gauntlet the Independents reopened the fight which has heretofore been advanced by the Bell. It is the aim of the new organization when completed to use its power where and when most needed in this state and will prove a valuable aid to the Independents in this struggle.

#### THURSDAY'S SESSION.

This session was called to order at 10:45 by Vice-President Holdoegel and the first matter to receive attention was a letter from President Hoge of the National Inter-State Association, relative to district organization.

During the afternoon session the reports of the various committees were received and the election of officers, which resulted as follows: President, P. C. Holdoegel, of

Rockwell City; secretary and manager, Chas. C. Deering of Boone; first vice, E. T. Averill, Cedar Rapids; second vice, E. E. England, of Mt. Pleasant; third vice, Hakine of Woodbine; treasurer, G. W. Graves, of Dennison; executive committee, J. S. Bellamy of Knoxville; E. H. Martin of Webster City; J. C. Thorn of Fairfield and Geo. N. Bandy, Des Moines.

The next meeting will be held at Sioux City.  
Among those present were:

R. E. Mattison, Lincoln, Nebraska; J. H. Doachond, Levi Faker and Frederick Fischer, of Shenandoah, Iowa; W. E. McKee, Montezuma; Iowa; W. G. Bowe, Marshalltown, Iowa; L. Werthum, Belle Plaine, Iowa; W. H. Fowler, Pella, Iowa; E. E. England, Mt. Pleasant; H. Baker, J. A. Duncan, P. C. Cockrill, C. H. Smith, Albert Korst, C. E. Jones and E. E. Halstead, of Sioux City, Iowa; Ed. Morehead, Ida Grove; J. H. Bradt, Rockwell City; J. G. Sanders, Houghton; E. C. Rodman, West Point; H. Henrickson, Elkhorn; W. E. Potts, Marne; J. G. Hoen, Afton; George E. Atkinson, Creston, Iowa; F. R. Jones, Iowa; J. F. Glenn, Denison; Phil. Zerwas, Manning; H. A. Kinney, Woodbine; C. C. Keister, Mitchellville; W. J. Way, Carson; L. Pillsbury, Mulford; C. A. Hallis, Hudson; John A. Anderson, Vinton; W. H. Barker, Sanborn; D. R. Kunkel, Humeston; John Young, Modale, Iowa; O. L. Laudestoger, Plymouth County Telephone Company; J. A. Brown, Chariton; D. R. Dawson, Story City; J. A. Peterson, Manchester; J. S. McConnell, Hopkinton; U. S. Alberman and F. M. Boardman, Nevada; D. M. Griswold, Des Moines; G. L. Saunders, Grinnell; H. A. Douglas, Cedar Rapids; Howard S. Baker and J. E. Duncan, of Sioux City; S. E. Clapp, Adell; J. A. Hannun, Olds Telephone Company; Ed Graham and J. F. Butler, of the West Branch Telephone Company; J. R. Musson, Musson Bros., Atlanta; R. A. Walker, Central Iowa Telephone Company; W. J. Thie, Inter-State Telephone Company; E. H. Sidwell, Johnson County Telephone Company; M. Millhatten, Anita; W. C. Ellis, Minburn; Jesse J. Whisler, Farragut Telephone Company; L. D. Robinson and E. G. Fax, of the Washington Telephone Company; Albert Whitacre, West Liberty; J. S. Bellamy and P. E. Bellamy, of Knoxville; J. C. Thorne, Fairfield; C. A. England, Van Meter; F. H. Stacey, Anita; Ala L. Walker, Oakland; D. C. Cooper, Shelby; Otto Borchert, Milwaukee, Wisconsin, J. Andre & Sons Co.; S. E. and Paul Clapp, of Aol; M. N. Goodson, Guthrie Center; W. O. Willing, Northwood; T. C. Way, Corson; D. Richardson, Lewis; George P. Campbell, Davis City; George O. Sier, Eagle Grove; J. C. Thorne, Fairfield; P. A. Walker, Iowa Falls; W. O. Simcake, Redfield. F. R. Brandy, Storm Lake; Ernest C. Kast, Minneapolis, Minnesota; J. M. Culberson, Logan; F. C. Musson, Atlantic; M. H. Driftmir, Clarinda; F. H. McJohnston, Fairfield; E. G. Kelly, Emmetsburg; Howard H. Herr, Ottumwa; L. D. Robinson and E. G. Fax, of Washington; A. T. Averill, Cedar Rapids; W. C. Smith, Marbel Rock; D. L. Way, Carson; R. S. Redman, Newton; Ben Nelson, Indianola; W. D. Dunsmore, Oskaloosa; Geo. D. McEeroy, Vinton; W. J. Stevton, Waterloo; James E. Morehead, Ida Grove; James Plaister, Ft. Dodge; F. W. Grimes and M. McFarlin, Des Moines.

### First District Meeting, Illinois Independent Telephone Association

The following program was carried out very successfully at Joliet, Illinois, April 10th, too late for us to give complete details. Full account of the meeting will appear in the later issue: "Objects of the Meeting," A. J. Vernier, Eastern Independent Telephone Co., Kankakee, Illinois; "Our Duties to the Public," H. E. Barbour, Ottawa Home Telephone Co., Ottawa, Illinois; "Can We Succeed Without a Chicago Connection?" J. F. Parsons, Inter-State Independent Telephone Co.; "How and Why to Organize," Hon. C. B. Cheadle, state secretary Inter-State Independent Telephone Co., Joliet; "Mutual Interdependence of Independent Companies," E. C. Hermis, Northern Illinois Telephone Co., Sandwich, Illinois; "Relation of the Business Man to the Telephone Company," Joseph Balliot; "Fixing Toll

Charges," W. F. Murray, Inter-State Independent Telephone Co., Aurora; "The Value of a Home Interest," A. J. Vernier, Eastern Illinois Independent Telephone Co., Kankakee; "How to Organize and Operate a Farm Line Company," G. E. Hargreaves, Manhattan, Illinois; "Does it Pay to be a Bell Licensee," Prof. J. C. Kelsey, Chicago.

The following officers were elected for the ensuing year: President, A. J. Vernier; vice-president, E. C. Hennis; secretary and treasurer, J. C. Joslyn. Executive committee is as follows: C. B. Cheadle, Joseph Balliot, D. V. Seigerlund, W. F. Murray and E. Rogers.



COL. J. D. POWERS, OF LOUISVILLE, KY.

Who talked on "The General Telephone Situation as Viewed from a Neighboring State," at the meeting of the Ohio Independent Telephone Association at Columbus, Ohio, on the evening of March 29.

Mr. Geo. J. Hewes, manager, showed his cleverness in advertising by the signs displayed in the convention hall at Des Moines, Iowa, for the Independent Telephone Clearing House. Read them and join your nearest association:

If you have the  
I. T. C. H.  
Infect your neighbor.

The more you scratch  
the more the  
I. T. C. H. spreads.

After four hours  
You will be  
Scratching with  
I. T. C. H.

All those who  
Scratch  
Have the I. T. C. H

Consult your best  
Interests and  
Join the I. T. C. H.



## Ohio Independents at Columbus

Members of the Ohio Independent Telephone Association, nearly 400 strong, met in annual convention at the Hartman hotel, Columbus, Ohio, March 29. It was one of the most interesting meetings held this year, and the action taken leaves no doubt, but what the Bell Company will have a harder road to travel in that state, than ever before. Probably the most important action, was over the recent defeat of the franchise, permitting the Home Independent Telephone Company from entering Cincinnati, which caused a storm of indignation to be expressed by the delegates during the meeting. They denounced the action, and adopted important resolutions.

President Beam called the meeting to order about 10 o'clock, in the parlors of the hotel, introducing Mayor Badger, who made a pleasing address of welcome. He said that this organization was the means of putting many people in touch with each other, which would not otherwise have been done without its assistance. He thanked the association for what had been done in Columbus, praised the automatic in that city, and thanked the company for putting it in. He extended the hospitality of the city to the delegates and their friends.



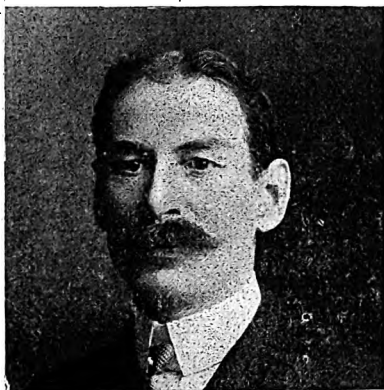
PRESIDENT BEAM

The response was made by Mr. J. C. F. Hull of Bucyrus. He made grateful acknowledgment for the hearty welcome extended by the mayor, complimenting the citizens on the progress they had made in Columbus, and expressed himself as being more especially pleased to be in the city on account of the fact, that it was where laws were made that "the wisest can not comprehend until crowned with immortality." He said that from the intelligence expressed in the faces of those about him, he felt that the standard of dignity would not be lowered, while they were in the city.

President Beam then made an address, in which he expressed his pleasure at again being given the privilege of presiding over such an important convention, and offered

congratulations on the large attendance. He said that the convention in Ohio of 1905 was said to be the largest and most enthusiastic state meeting ever held, but that the assemblage which he was addressing, surpassed all others in point of numbers and enthusiasm. He thanked the members for the valuable assistance rendered the association during the past year, especially the executive committee and district vice-presidents and their committees, and that they were all indebted to the manufacturers and supply houses for support in every line of activity that the association has fostered in its progress. He also thanked the trade journals for giving publicity to articles relating to progress made by the association, and, also, the newspapers of the State, and the Associated Press. He said that a few years ago, it was difficult to get favorable notice of any Independent Telephone items, but that now with over 25,000 stockholders, the great number of exchanges and the thousands of subscribers in the State, that such items are read with more interest than news. He dwelt at considerable length on the importance of the organization and stated that before it was established upon a permanent basis, that each local company had to shift for itself, fighting singly the organized opposition with one head, and unlimited wealth and resources, and that had this state of affairs been permitted to continue, every company would have been swallowed up by the opposition and the Independent movement crushed. He referred to the fact, that twelve years ago, the Bell company had nearly 50,000 telephones in service in Ohio, and that only a limited number of the people had been educated to know the great value of telephone service either in business or social circles. That the Bell company did not solicit or make any effort to extend its service, and refused to extend its lines to rural districts, leaving a great many important towns and villages without telephone connections. This is where the Independent companies commenced, and were immediately attacked by the Bell company with infringement notices tended to intimidate the public and capital. Agents made personal calls and tried to discourage by threats and other underhanded means assistance to the Independents. The second line of attack was, to reduce rates, and in some cases service was free, and third, to attempt to sub-license Independent companies, which also failed to a considerable extent. The last proposition Mr. Beam said was to get Bell Telephone lines in on Independent switchboards, calling the same neutral territory and offering a flattering proposition in connection therewith. He also called attention to the fact, that just one year ago Ohio Independents had 190,000 telephones in service, and that to-day they have approximately 250,000, a gain in twelve months of 60,000 telephones, which is more than the Bell monopoly had at the end of 18 years of undisputed occupancy of the field of Ohio. That 367 incorporated companies were doing business in the state with an investment of over \$30,000,000, and that much of it was due to the association, which in the first place joined the several companies into an invincible union and eliminated any feeling of jealousy regarding the division of territory, besides establishing uniform rates and brought together influential men and stock-holders, representing each line of industry.

Mr. Ralph Reamer, secretary and treasurer of the association made his report of receipts and expenditures for the year ending March 29, a notable feature of which, being the cost of maintenance of the association. Considering the amount of good it has done for the cause in the



RALPH REAMER, Sec'y.

state, these items were exceedingly small and reflects credit on the management of the officers of the association.

At this time the announcement was made by President Beam, that the Howe bill, a measure which was considered detrimental to the Independent telephone interests, was about to be passed in the Ohio State Senate and a committee should at once be appointed to go to the State House and enter a protest. Mr. Beam said that the Independent Telephone companies do not need legislation as the reports show, because competition is the best measure of rates. That if the Howe bill passed the house, that it would add \$1.00 a telephone in addition to the present taxes in Columbus, as well as in every other city and town in the state. Upon motion the chair appointed G. P. Thorpe, of Wilmington; J. G. Brailey, Jr., of Toledo; Mr. J. C. F. Hull, of Bucyrus, Mr. Hendrickson, of Urbana; C. D. Juvenal, of Springfield; W. F. Lauback, Akron; Mr. DeVore, of Byron, and W. W. Fisher of Bellefontaine, and W. H. Baum, of Batavia. This committee at once left the hall and later in the day reported that they believed they had effectually blocked the passage of the bill, although the danger point was not at the time passed, and that every member of the association, who had an acquaintance with a senator, should make it his business to see that senator and use his influence with him against the passage of the bill.

The following committees regular and special were appointed:

Grievance Committee—W. P. Bogardus, Mt. Vernon; Washington Hyde, Warren; F. A. Knapp, Belvidier.

Committee on Nomination—W. F. Lauback, Akron; I. H. Thiedeck, Sidney; Mr. DeVore, Byron; J. B. Hoge, Cleveland; Colonel Rush, Greenville.

Committee on Finance—C. Y. McVey, Cleveland; J. G. Brailey, Jr., Toledo; G. I. Johnston, Columbus; W. G. Thompson, Hamilton; E. L. Barber, Wauseon.

Auditing Committee—W. G. Thompson, Hamilton; E. L. Barber, Wauseon.

Auditing Committee—J. B. Rhodes, Zanesville; C. L. Norton, Cleveland; C. H. Hollender, Newark; J. D. Johnson, Celina.

Committee on By-laws—W. L. Cary, Cleveland; D. E. Sapp, Mt. Vernon; G. P. Thorpe, Wilmington; A. H. Dodna, Bridgeport; S. Crosby, Ashtabula.

It was at this point that Mr. I. H. Thiedeck of Sidney, introduced his resolution, regarding the situation in

Cincinnati. It was seconded by W. Gilbert Thompson, was passed and is as follows:

WHEREAS, The numerous Independent telephone companies in Ohio, comprising 793 exchanges with over 240,000 telephones in service owned and controlled by 21,738 stockholders, have been built and put in operation by citizens of the state of Ohio, amongst whom are merchants, manufacturers, bankers, lawyers, doctors, farmers and capitalists, who have invested their money and given their influence and time for the purpose of getting better and more efficient telephone service at reasonable prices and

WHEREAS, Nearly every city in Ohio is now reached by Independent long distance lines, and whereas the investment in said Independent telephones, lines and exchanges now represent a cash outlay of more than \$30,000,000 and whereas, this large investment should command the respect and encouragement of wholesale and retail merchants and manufacturers in such cities as have not yet been reached by the Independent telephone people by reason of the delay in granting a franchise for a competing telephone. Therefore be it

Resolved, That the stockholders and friends of the Independent telephone people in convention assembled hereby respectfully but earnestly insist that such cities or towns as refuse to permit fair competition in telephony by defeating franchises to enable Independent Home telephones being established so as to connect with like exchanges in other parts of the state, shall be deemed to be unfriendly to our people and unworthy of our support in trade as against other cities where the Independents are recognized and afforded an opportunity to do business, especially is this true with the Queen City of Ohio.

W. B. Woodbury, general manager of the Home Telephone Company, Detroit, was called upon at the beginning of the afternoon session by President Beam for a short address. If all Independent Telephone men were like Mr. Woodbury, the Bell company would doubtless have been out of existence years ago, as this gentleman took about as decided stand as any man could in the cause he espouses. He said that the Bell had been adopting their usual lying tactics in Detroit, and that they were going after them tooth and toe-nail. He said that many people were under the impression that the Bell company is invincible, but that the Bell company is not invincible and that if the Independents go after them right, that the latter will win out. He is very enthusiastic over the Independent situation, and predicts great things for the cause in the near future.

Mr. E. L. Barber of Wauseon, spoke of the work being done in the south by the Independents and pointed with pride to the fact, that much has been done for the cause, and that the Bell has come to the realization, slowly but surely that if they want to keep anything at all, they must be doing something in the way of improvements. Like all the other speakers, Mr. Barber was very enthusiastic, and said that the future gave great promise.

President J. G. Hoge made an interesting address on National Development and Progress of the National Inter-State Telephone Association, with illustrations on maps of several states and one large one of the United States. This address is given elsewhere as nearly verbatim, as it could be without the maps, copies of which could not be obtained for reproduction in SOUND WAVES at this time.

At the roll call of districts and responses by vice-presidents of each, every report showed progress and

great enthusiasm in the work, which had been made the past year.

Among those taking part in the "Question Box" discussion were:

W. G. Thompson, Hamilton; D. E. Sapp, Mt. Vernon; J. S. Brailey, Jr., Toledo; Jay Secore, Toledo; O. F. French, Cleveland; S. E. Ward, Mansfield; George Metheany, Lima; C. Y. McVey, Cleveland; Colonel Rush, Greenville; J. B. Rhodes, Zanesville; C. P. Thorpe, Wilmington; I. H. Thedieck, Sidney; Frank A. Davis, Columbus; D. J. Cable, Lima; W. F. Laubach, Akron; H. P. Folsom, Circleville; W. P. Bogardus, Mt. Vernon; J. E. Coen, Vermillion; Sam Morton, Camden; R. E. Hamblin, Toledo; Cyrus Huling, Columbus; H. M. Daugherty, Columbus, and D. A. Yoder, Toledo.

As a further compliment to the work of the officers of the association the past year, all were retained for the ensuing year as follows: President, Frank L. Beam; secretary and treasurer, Ralph Reamer; members of executive committee, Ed L. Barber, Cyrus Huling, W. Gilbert Thompson, J. B. Hoge, Dwight E. Sapp and C. Y. McVey.

Press Committee—William B. Woodbury, G. R. Johnston, James S. Brailey, Jr. Committee on membership—C. S. Norton, E. E. Knox and Ralph Reamer. Committee on registration—John Harney, S. E. Ward and E. L. Coen. Sergeant-at-arms—Charles Duncan, George Carter and Samuel Morton.

#### CLOSED WITH A BANQUET.

A banquet at the Hartman hotel, closed the meeting in which 300 people participated. H. M. Daugherty of Columbus, presided, and the following program was carried out: "Ohio's Future," Mr. Walter B. Richie, Lima, Ohio; "The Cincinnati Situation," Judge C. B. Matthews, Cincinnati, Ohio; music; "Why We Should Maintain a State Association," Frank A. Davis, Columbus, Ohio; "The General Telephone Situation as Viewed from a Neighboring State," Colonel J. D. Powers, Louisville, Ky.

#### Worked Like a Charm.

Mr. J. A. Harney, assistant secretary of the National Inter-State Telephone Association was in attendance at the State meeting of the Ohio association at Columbus, March 31. Mr. Harney took personal charge of the work of registering the names of those who were present, and introduced a card system, each card containing in blank form, the name, the company represented, and the place of residence, also, the hotel at which such person could be found. This registration scheme of Mr. Harney's worked out to the satisfaction of the officials of the association and to everyone in attendance, being much better than the old book form style, having no limit to the number of people that could be registered at one time, and saving annoyance in taking care of a crowd. The alphabetical arrangement was so, that just a glance would tell whether a given name had been registered. Mr. Harney is to be congratulated on his idea in this direction, and the expediency in which he conducted this work.

A company has been organized at Fort Smith, Ark., with \$250,000 capital stock by Charles Suttre of St. Louis, Mo., and associates, to take over and operate the Pan Telephone Company. Improvements will be made to the exchange, including the installation of a new switchboard, and extensions made.

#### Sixth District of Illinois Meets.

Managers of Independent Telephone companies of the sixth district of Illinois, comprising nine counties, met in Galesburg, March 16, for the purpose of furthering the business relations of the companies, and discussing matters of mutual benefit to them. This meeting was held in the new exchange building, and representatives from all the exchanges in the district were in attendance. State President Cheadle of Aurora could not be present. At the morning session the election of officers for the ensuing year was had with the following result: President, W. J. McQuiston; vice-president, C. M. Ervin, Macomb; secretary and treasurer, Ralph Roadstrom, Galesburg.

Cheaper toll service was the topic of the discussion during the meeting, and plans were laid by which it is hoped the patrons will eventually be offered a lower rate than is now offered.

The discussion of a State Clearing House was taken up at the afternoon session, and some central point for such clearing house, where various lines could send their transfer bills and thus dispense with details which the present system makes necessary, was considered. The Iowa plan was favored, and will probably be adopted later.

The standardization of toll operators, in order to facilitate the putting through of toll calls, was another matter which occupied attention and other minor details were discussed. An executive committee was appointed on which are, W. J. McQuiston of Warren county, C. M. Ervin of McDonough, H. W. Stewart, of Henderson, Robert Swearingen of Mercer and F. C. Woods of Knox.

On the committee on by-laws and constitution were appointed, H. W. Stewart, of Henderson county, W. J. McQuiston of Warren and J. G. Grabby of Warren.

W. B. Burke of Burlington, Iowa, representative of the Mississippi Valley Telephone Company of Eastern Iowa, was present and he reported that within 30 days the line will be extended across the Mississippi river at Burlington, which will place the sixth Illinois district in direct communication with eastern Iowa, opening up for this district direct long distance communication with Muscatine, Fort Madison, Davenport, Ottumwa, Des Moines and other Iowa towns.

During the session the Galesburg Union Telephone company entertained the delegates by showing them through their new exchange building.

The counties in the sixth district are: Mercer, Knox, Henderson, Warren, Hancock, McDonand, Shuyler, Adams and Brown. The secretary was empowered, if necessary, to call another meeting within the succeeding ninety days.

At the recent meeting of the Eastern Kansas Telephone Co., held at Kincaid, the following officers were elected for the ensuing year: President, J. W. Garrison; vice-president, A. P. Caldwell; secretary and general manager, R. L. Fraser; treasurer, J. M. McCaslin. At this meeting a dividend of 10 per cent was declared and paid in cash. This system now includes Kincaid, Selma, Oakwood, Haskell, Bayard, and Lone Elm. The company contemplates putting in two more exchanges, besides numerous toll lines, during the coming season.

The Lycoming and New Haven Telephone Company of Oswego, has been incorporated. C. H. Daniels, Oswego; Newton F. Coe, Lycoming, incorporators.

# Meeting of District No. 1 of Kansas

Exchange owners of District No. 1, of Kansas, met in session at the Hotel Byram of Atchison at 10:30 a. m. March 22, '06. The house was called to order by C. E. Betts of Atchison, president of District Association No. 1, and Mr. J. A. Zimmerman of Valley Falls, Kansas, was made temporary secretary.

The first thing in order was the roll call. The following gentlemen were present:

O. M. Anderson, Huron, Kansas; Julius Rumble, Weston, Mo.; A. M. Moun, Nebraska City; J. L. Berry, Atchison; C. J. Myers, Kansas City; R. H. Shove, Winchester; A. B. Clark, Oskaloosa; O. G. Sellers, McClouth, Kansas; C. E. Betts, Atchison; C. W. Roberts, Perry; J. A. Zimmerman, Valley Falls; Del Valentine, Effingham; S. A. Frazier, Atchison; E. F. Norris, Centralia; E. W. Thornborrow, Wetmore; J. M. Lueck, Neta-woka; E. W. Moore, Effingham; J. N. Roach, Muscotah; Parker Nicholas, Nortonville; Walter Moxley, Nortonville; Judge Dimm, Holton; Dr. J. J. Newell, St. Joseph; J. F. Barnett, Rutledge, Missouri; E. L. Dunlapp, Neosho, Missouri; G. B. Roberts, Topeka, Kansas; J. M. Morley, Severance; H. C. Baker, Hiawatha; A. J. Stevens, Hiawatha; Theodore Gary, Macon, Missouri.

Chairman Betts explained the object of the meeting, and also the result of the State meeting held at Wichita on January 22 and 23, in which he was elected president of the District No. 1, including the following counties: Nemaha, Brown, Doniphan, Jackson, Atchison, Jefferson, Leavenworth and Shawnee. Mr. Betts went on to say that the object of this association was to form a closer working agreement among the exchange owners of this territory and to better the conditions of the service, and to arrange for additional toll lines throughout the state, and many other things along the line of promoting the welfare of the Independents in the state of Kansas.

Next in order was a talk by the traveling secretary of the Missouri Independent Telephone Association, James F. Barnett of Rutledge, in which he explained his methods of organizing and the gathering of statistics, and also of the operating and organizing of a secret service bureau in order to keep in touch with what our competitors are doing, and handling the press work for the Missouri Association. He explained the way in which he carried on his work with the farmers and how he educated them into the Independent ranks.

Next was a talk by Dr. J. J. Newell, of St. Joseph, Mo., along the lines of the closer association, and the relation existing between the telephone exchange owners, and in his talk he showed where the relations were so strong from one Independent to the other that it would be a matter of sacrifice on the part of the neighboring exchanges, should they sell out to their competitors and leave their friends who have stood by them and built up their business with all the hardships to bear, and that the parties selling out would receive the benefits of the many years of hard work of their neighbors.

Mr. Theodore Gary of Macon, Mo., vice-president of the National Inter-State Telephone Association, then outlined the policy of "What are We in the Business for?" He demonstrated very nicely that the main thing in the telephone business was to receive pay for your labor, brains, and money invested in successfully building up the Independent interests. That he believed there should

be that warm neighborly feeling between all the operating companies, and closer relations than we now have, and that we must not allow ourselves to go out and get business unless there was some money to be made out of the new business after we acquire it.

Next in order was a talk from Mr. O. M. Anderson, Huron, Kansas, in which Mr. Anderson made a very strong argument regarding the relation of the Independent operators, and that the way he made a success of his business was by taking care of the public sentiment which he feels has been a big factor in building up the Independent interests, and that we could not afford to lose sight of that warm relation which should exist between the operators and the patrons of the Independent system.

Mr. A. J. Stevens of Hiawatha, Kansas, said that he felt that sentiment really ought not to be allowed to enter into the factors of the telephone business, and it should be governed by a purely money proposition.

Mr. J. A. Zimmerman of Valley Falls, Kansas, expressed himself that no Independent operator could afford to sacrifice his principles in selling out to our competitors, leaving the men who have been the means of supporting him in his position, and making him a successful telephone man; that under no circumstances would he sell out to anyone unless it was an Independent operator, and if he did, he would not feel that he could ever justify himself in going off and leaving his friends to bear the burden who have fought side by side with him while he would reap the benefits, feeling that he was justified in so doing.

The afternoon session began promptly at 1:30. The first thing was a report by the committee on by-laws and constitution, which consumed quite a good deal of time.

Mr. C. J. Myers of Kansas City, talked on "Toll Line Prospects and Future Extensions."

The call for membership and dues, membership fee being made \$1.00, resulted in nearly all the companies who had representatives there becoming members of the District Association, and also of the State association.

The meeting adjourned subject to the call of the president.

It was reported at Des Moines that the contract agents of Iowa Bell are offering the Independent Mutual telephone companies connections without definite contracts as to time and were not stipulating Bell receivers and transmitters. If such is the case it indicates to what straits they are driven by the stanch loyalty of the Iowa Independents who appreciate thoroughly the disadvantages of such alliances.

Mr. C. O. Harris, well known in the Independent telephone field, severed his connection with the Utah Independent Telephone Company, April 1st. Mr. Harris is not giving his future plans for publication, but has undoubtedly something very important on the string, which will be announced later. His successor is Mr. Charles G. Vickery, formerly superintendent of the Rochester, N. Y., Telephone Company.



## OFFICIAL BULLETIN No. IX.

## National-Interstate Telephone Association.

General Headquarters, 708 Electric Building, Cleveland, O.  
March 16, 1906.

## Maps:—

Since Bulletin number eight was issued, toll line map of West Virginia has been commenced. This makes fourteen state maps, all told, on which we are working at present. The map of Ohio is practically completed, and will be printed in connection with the latest Independent statistics of the State for distribution at a nominal price on or about May 10th. All Ohio companies who have not furnished data for their systems are urged to do so without delay, so that their lines may be included in the map when published.

We want data from other States, too. Send us that map of your line at once. Don't wait for a personal letter.

The Committees announced last month have taken up their work and would like to hear from practical Independent men regarding the subjects to be considered. Every one connected with the Independent movement is interested in the work of these committees, and there are many who are peculiarly qualified to assist them. Now is the time to give your associates in the telephone field the benefits of your ideas or experience. Address your communications to the chairman of the proper committee in care of this office.

## COMMITTEES.

Standard Forms of Accounting.  
Standardization of Equipment.  
Standard Operating Rules and Regulations.

## CONVENTION.

The annual Convention this year will be held in Chicago at the Auditorium Hotel, on June 26, 27, and 28th. The change in place to Chicago from St. Louis, as previously announced, was authorized by the Executive Committee at the request of many prominent telephone men, in view of the fact that the Kinloch Telephone Company of St. Louis will be cutting over to their new switch-board at the time of the convention, and request that the Association meet in their city next year, when they will be in a position to properly entertain them.

## NEW ASSOCIATIONS.

We take pleasure in welcoming another State organization into the Independent field. The Arkansas Independent Telephone Association was organized at Little Rock on February 11th. Mr. Eugene Hale, Ozark, is President; Mr. John B. King, Texarkana, Secretary. A complete list of officers and report of proceedings have already been published in the journals. Success to the latest arrival!

## FINANCIAL.

Independent telephone securities are regarded as more substantial and occupy a higher place in the investment world to-day than at any time in their history. Large amounts are now being sold in the markets of the country on a five and six per cent basis. Reports received indicates that more new money will be spent this year by Independent Companies than in any one year in the past. A great deal of this will be used in taking care of new development by making extensive additions to existing plants and extending toll lines into undeveloped territory. A large amount, however, is being spent on new properties in building up the few remaining cities where Independent exchanges have not been installed. That the value of Independent securities is being generally recognized is attested by the fact that some of the largest financial interests of the country are investing heavily in these securities, and consider them as safe and profitable as the securities of other public serving corporations. The preference shown by the citizens of various places for Independent service does much to increase the favor with which Independent securities are being regarded by investors. At Seattle, Washington, over 2,000 telephone subscribers have ordered the Sunset Telephone Company (Bell) take out their instruments, as they prefer to use the Independent service exclusively. A number of California Cities have an Independent development as high as one telephone to every five of population.

## TELEPHONE PUBLICITY.

The telephone situation is being ably presented to the reading public of the country in a series of articles "Fighting the Telephone Trust" by Paul Latzke, which are being published in the Success Magazine. The first and second of these have already appeared in the February and March numbers. Jesse W.

Weik has also written an able article entitled "The Telephone Situation," which appeared in the Atlantic Monthly for February, and has been reviewed in the "Review of Reviews" for March.

## SUPPLY DEPARTMENT—THE "SHIELD."

We are glad to note an increased demand for the Standard toll sign. This sign is, in effect, the banner of Independent Telephony, and all Independent companies should take pride in displaying it at their exchanges and pay stations. Show the people where you stand, and help educate them to "Look for the Shield."

Illustrated catalogue for the asking.

The popularity of the gold plated "Shield" button continues. Are you wearing one? Sample 35c.

## OBITUARY.

Mr. P. T. Spencer, Secretary of the California Independent Telephone Association died February 12th. We extend our sympathy to his family and friends, and his fellow members of the California Association. They have sustained a severe loss in the death of so true a friend, and so able an officer. Mr. Spencer was one of the delegates from California to the National-Interstate Convention last year, and took an active interest in every thing pertaining to the welfare of Independent Telephony. His death at this time is to be deeply regretted.

## Not so Slow in Texas.

The following letter received from J. B. Earle, manager of the Texas Telephone Company, Waco, Tex., is self-explanatory:

You will probably be interested in an account of our fire at McGregor, Texas, where the Brazos Valley exchange of three hundred and twelve (312) telephones was burned on the night of Feb. 6th.

Mr. Davidson, our Superintendent was in McGregor at the time, and rang at 11:40, stating that the exchange building was on fire, and would be a total loss. Without waiting, we immediately wired specifications for a new central energy switchboard of four hundred (400) capacity, to the Stromberg-Carlson Telephone Mfg. Co. with instructions to spare no expense in giving us the quickest possible delivery.

We immediately procured cable to rebuild the business portion of town, putting one block of underground to office in four hundred (400) pair cable, shipping same from New York. Our entire equipment of cable, switch-board, power-board, terminal facilities etc, were ordered received and installed by the 21st, or just fifteen days from date of fire. This was due to the fact that the Stromberg-Carlson Co. built the board with relays of men working day and night, and the entire apparatus, filling almost one-half car came by express. As a result, the people here are stauncher friends of the Independent Co., if possible, than, before the fire.

The Bell employees were up before working hours next morning, each with arm full of telephones trying to place them with the Independent subscribers, assuring the people that it would take sixty (60) days to rebuild the exchange.

As a result of the fire, the Independent Co., lost one subscriber and gained fourteen.

Many subscribers went to our local manager immediately and asked to settle their bills, assuring him that they would not only wait for the exchange to be rebuilt, but would ask no rebate for time the exchange was out of service; thus showing the appreciation of the Texas people toward a company who came to their relief and gave them good service at reasonable rates and developed a rural business to the fullest possible extent, where before, telephone lines were not thought of.

On Dec. 23rd, there was a fire in Clifton, Texas, that wiped out the entire business portion of town, including the building occupied by both the Bell and the Independent Co.

The next morning after the fire the manager of the Bell Company made a Paul Revere ride across the muddy prairie and up the Bosque valley, while the Independent general manager sat in his office with a blue print of the town and a stenographer, dictating orders for new material, including poles cables and an entire inside equipment.

On the morning of the 26th, three days after the fire, our material was on the ground and in six days we had an exchange of one hundred and twenty-five (125) telephones working, having built a temporary exchange building in the street at the corner where the exchange was to be permanently located. The Bell Co., succeeded in getting their thirty-four (34) telephones in position in twenty-nine days.

# The Pole Changer

By the term pole changer is meant a switch, by means of which, a current may be changed in direction. In this article the pole changer used in connection with the ringing of telephones is to be considered. Most every body is familiar with the ordinary double pole double throw switch connected as a pole changing arrangement. The diagram is shown in Figure 1.

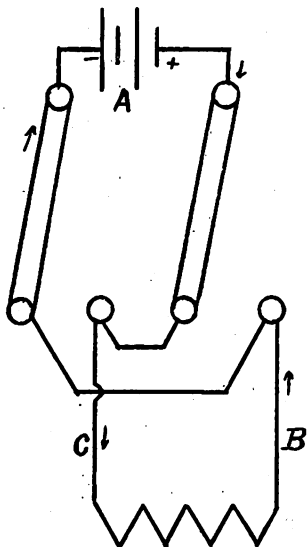


FIG. 1

Suppose that A is a battery, D is a switch and B and C is the line. With the switch levers to the left hand position current from the battery will flow through the right hand lever over line C back through the line B the left hand lever and then back to the battery. With the levers thrown to the right, the current will flow first over the line B and then back over the line C and to battery. It is thus seen that the throwing of the switch one way permits the current to flow one way over the line and then when the switch is thrown oppositely the current reverses. If, therefore, the switch is continually thrown back and forth there will be an alternating current on the lines B and C. This arrangement would not do for the ringing of the telephones, for it amounts to a make and break of the current every time the switch is thrown. This would cause induction between the lines of a system and that would interfere with the service.

Figure 2 shows a graphical representation of the

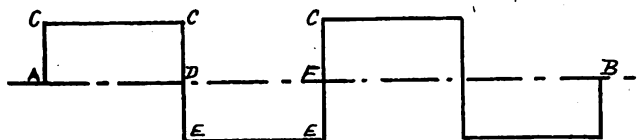


FIG. 2.

current which would pass out over the lines. Starting at A with no current, the switch is closed. The current

would almost instantly rise to a value represented by C. The current would continue at a constant value until the switch is reversed when the current would drop from the value C through zero value to the value E in the opposite direction. It is seen that every time the current is reversed the change is instantaneous. If a receiver were placed in circuit there would be an exceedingly sharp click heard. It is this sharp change that causes the trouble from induction. Some method must therefore be arranged so that the change will not be so sudden. That is the current must be given a little time to make the change.

Figure 3 is like that of Figure 1 except that there is

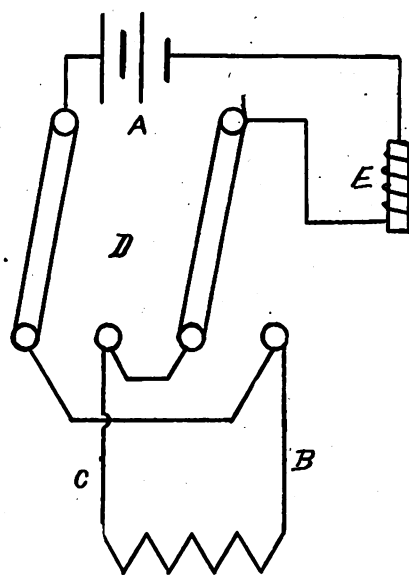


FIG. 3.

a coil E inserted in the battery circuit. This is a coil of copper magnet wire wound on an iron core. This is what is known as a retardation or impedance coil. When the current is turned on the coil develops a counter electro motive force opposite to that of the battery and thus prevents the rapid rise of current. When the current is reversed the effect of the coil is to tend to keep the current

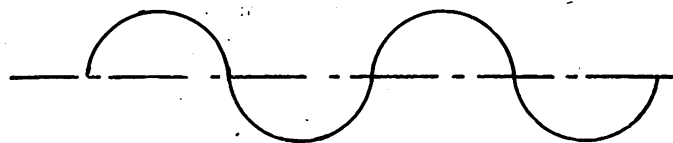


FIG. 4

flowing in the same direction and thus the current is prevented from falling suddenly. The current may then be shown as in Figure 4. It will be seen that this current rises gradually from the value of zero to the full maximum and then gradually falls through zero to the negative maximum. The ideal current curve is that known to mathematicians as the sine curve. In practice the sine curve is only approximated, but quite closely.

Of course, for ringing, one can not throw the switch back and forth by hand. Some means must then be de-

vised for the vibrating of the switch. We are all familiar with the mechanism of the ordinary door bell. This switch is moved by exactly the same mechanism. Figure 5 shows the vibration circuit. Current from a battery A flows through a magnet B armature C contact D and

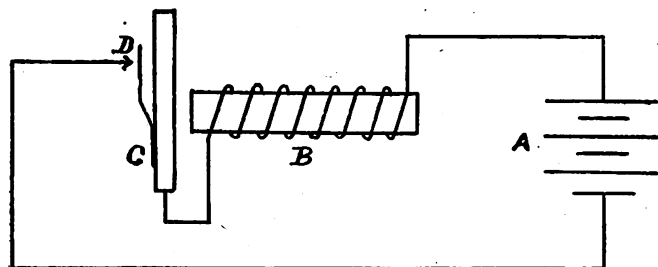


FIG. 5

back again. This current causes the core of the coil to become magnetized and the armature is drawn to it. The drawing of the armature opens the contact D and then the current is broken. As soon as the current breaks the armature falls back and the circuit is made again. The armature is thus kept vibrating. If the switch levers were to be mounted upon this armature a pole changing would result. In practice this is exactly what is done.

Figure 6 shows the circuit of the pole changer that is

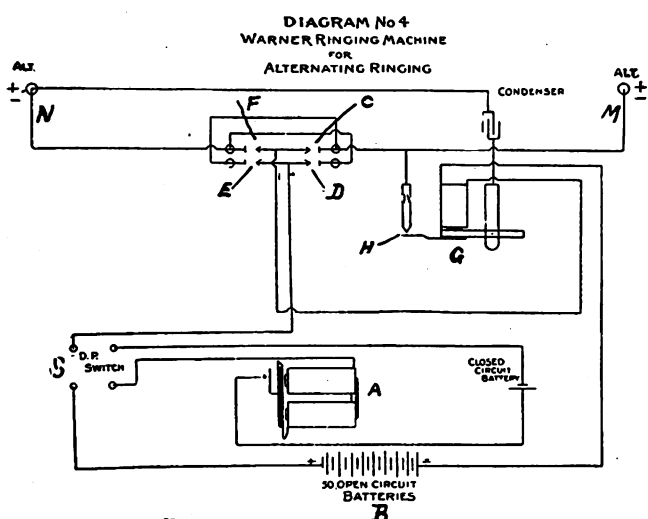


FIG. 6.

made by the Warner Electric Company of Muncie, Indiana. This particular circuit is that of the instrument which gives only alternating current. A represents the magnet that is used to vibrate the switch as is explained in the description of Fig. 5. This vibrator magnet is operated by the closed circuit battery as indicated. This battery must be of the type that will give a small amount of current for a long time. The ordinary dry cell or the cell using salammoniac will not do for it will run down too rapidly. The cell usually used is the Gladstone Lalande battery. This battery will last a long time on a closed circuit. The elements are copper oxide and zinc while the chemical is caustic soda. This battery is not used to ring the bells, merely to vibrate the pole changing switch. When it is desired to start the pole changer to operating, the double pole switch S is closed. This switch throws on the vibrator battery and also the ringer battery B.

The contacts C and DD of the pole changing switch

are closed when the magnet A pulls up the armature. Current from battery B then flows from the positive side through the switch S contact D, binding post N out over the line, back to binding post M, contact C, relay G, and to the negative side of the battery B again. The contact on the vibrator A then is broken and the armature falls back causing contacts C and D to open and E and F to close. The current from the battery then flows from the positive side of the battery B through the switch S, contact E, binding post M, out over the line, back to post N, to contact F, relay G and negative side of the battery. It is seen that the current is caused to change its direction at each swing of the switch. The relay G acts as the retardation coil and prevents the too rapid rise of the current in the circuit as well as the too rapid fall.

This relay is to switch the condenser shown, in and out of the circuit. The condenser is connected across the contacts of the pole changer and tends to prevent the excessive sparking of the current at the contacts and also it assists to smooth the ringing current so that it will approximate the shape of a sine curve. When the ringing key at the switchboard is pressed, current from the battery B, flowing through the relay G, pulls down the armature and connects the condenser. The reason for cutting out the condenser is to prevent the consumption of the battery through the condenser. When the switch swings to the right the condenser is charged just as the contacts are made at C and D. As soon as the contacts C and D are opened, the condenser is discharged to the line. Then when the switch swings back, the same thing again occurs, except that the condenser is charged in the opposite direction. When the pole changer is vibrating on an open circuit, the condenser is not discharged between contacts, but it is alternately charged and discharged by the oppositely directed current from the battery. This would ultimately run the battery down.

Figure 7 shows another form of the same pole changer

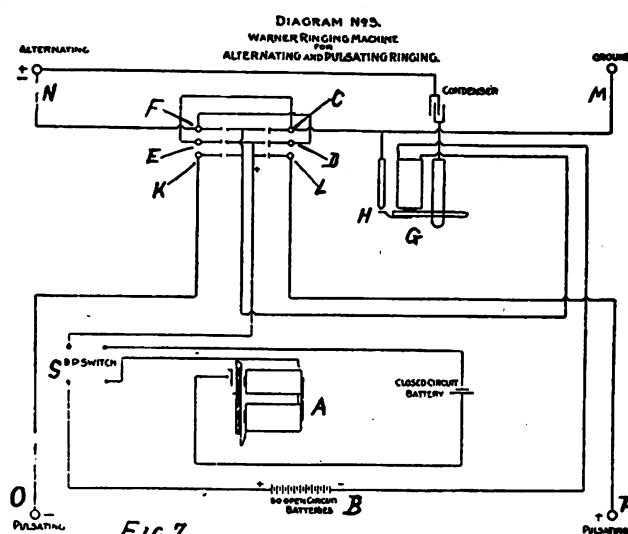


FIG. 7.

but there is additional contacts provided so that pulsating current may be produced. This current is used on certain party line systems where it is necessary to have an interrupted current of one or the other polarity. Current passes from the positive side of the battery B through the switch S, to contact L, binding post P, out over the line and back to post M, contact C, relay G, and to the negative side of the battery. This gives the positive current. The negative current is passed through the

contact K in a manner exactly similar. All that the pulsating current is, is an interrupted current caused by a make and break action of the contacts.

Figure 8 shows the circuit of the Sandwich pole

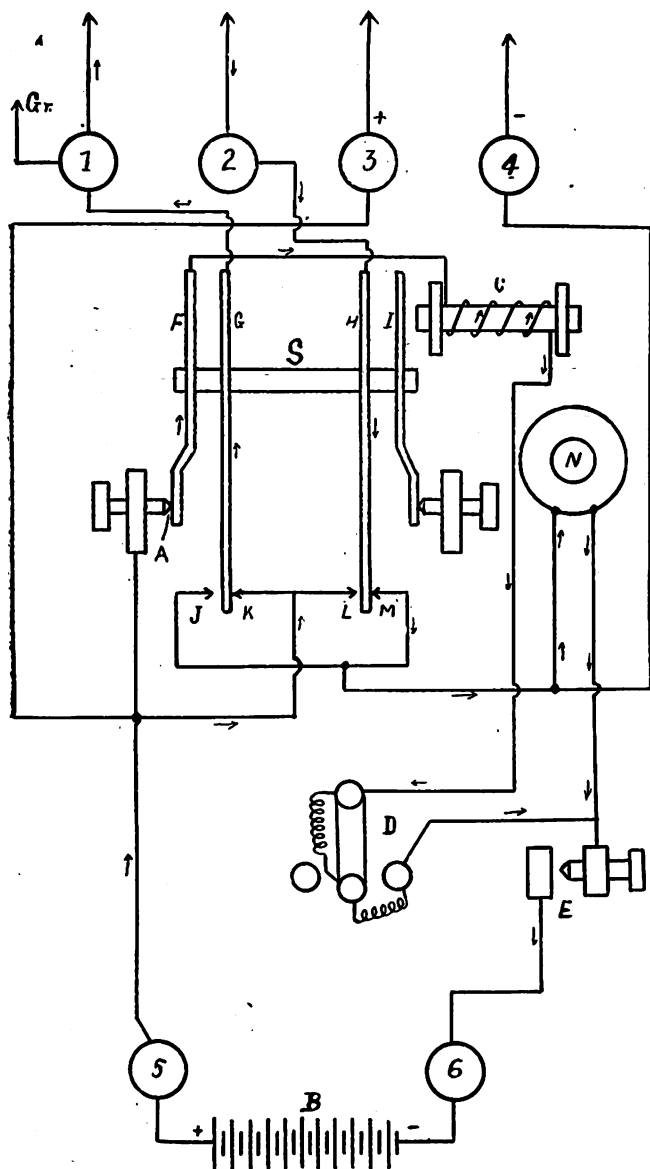


Fig. 8.

changer, made by the Sandwich Pole Changer Company of Sandwich, Illinois. The arrangement of this is somewhat different from that of the one previously described. In this machine, the ringing battery is used for doing the vibrating. To keep the battery from running down rapidly, the relay or vibrating magnet is wound to 11,000 ohms. As the voltage of the battery is not more than 90, it can be seen that the cells would not run down very rapidly. The current at most would be but .008 amperes.

The action of this pole changer is as follows: Current from the battery B flows from the positive side to the contact is again closed. The four springs F, G, H, I, switch D, cut in switch E and back to the negative side of the battery. When the current energizes the magnet C, the contact A is opened, the magnet then lets go and the contact is again closed. The four springs F, G, H, I, of the vibrating pole changing switch S are thus kept

moving back and forth. Suppose the switch S is swung to the right. Contacts K and M will then be closed. Current from the battery will then flow from the positive side to the contact K, spring G, binding post 1, out over the line and back to binding post 2, to spring H, contact M, to the retardation coil N, switch E and negative side of the battery. When S swings back, contacts J and L are closed, the current then flows as follows: From the positive side of the battery it goes to the contact I, spring H, binding post 2, line, binding post 1, spring G, contacts J, retardation coil N, switch E and back to the negative side of the battery.

The pulsating current is obtained as follows: For the positive pulsations the current passes from the positive side of the battery to binding post 3 over the line, back to binding post 1, to spring G, contact J, retardation coil N, switch E, and back to the negative side of the battery. For the negative current the battery discharges from the positive side and the current passes to contact K, spring G, binding post 1, out over the line, back to post 4, to retardation coil N, switch E and back to negative side of the battery.

In Figure 9 is shown another form of pole changer.

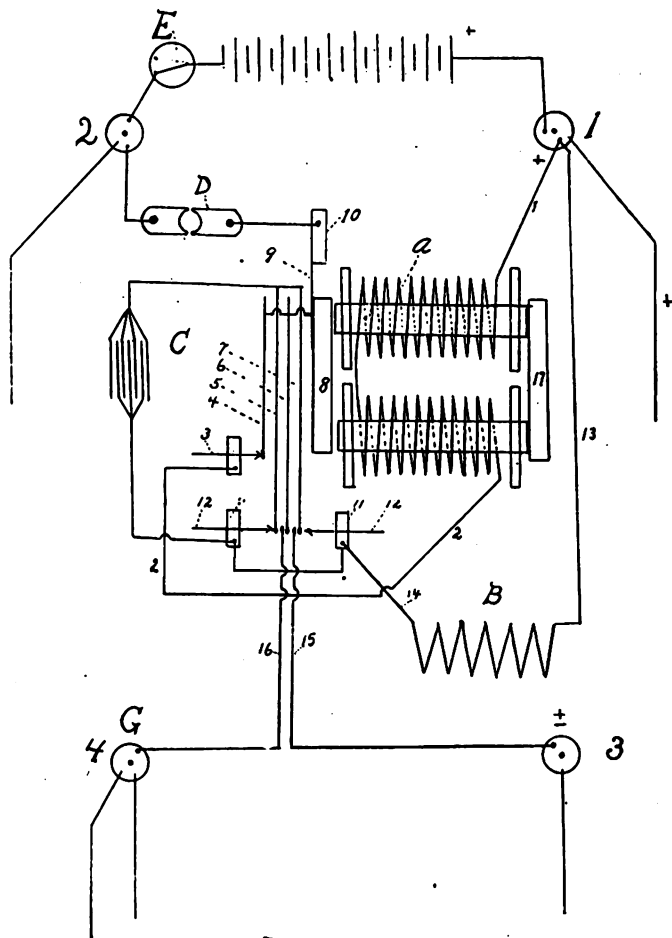


Fig. 9.

This one is somewhat different from the ones previously shown and described. In this pole changer there is a non-inductive resistance B in series with the battery to prevent too great a flow of current to the line in case of a short circuit. To prevent the trouble from induction, there is a compound condenser inserted into the circuit. The action is as follows: The alternating current is gen-



erated over the circuit starting from the positive side of the battery and passes through the resistance B, contact 12, spring 7, spring 5, conductor 16, binding post 4, out over the line and back to post 3 conductor 15, spring 6, switch D and then to the negative side of the battery. When the springs of the vibrating switch swing to the opposite side the current will then pass through the resistance B as before through the contact 12, spring 5, spring 7, conductor 15, binding post 3 out over the line and back to post 4, conductor 16, spring 6, switch D and then back to the negative side of the battery. It will readily be seen that the current passes in opposite directions through the line at each swing of the springs. The condenser C prevents the arching of the current at the contacts of the springs and at the same time prevents the sudden rise of the current on the line. Whenever the springs 7 or 5 are in contact with the points 12, 12, the condenser is short-circuited. But in swinging from one contact to the other, the condenser is alternately charged and discharged. The excess of battery passing into the condenser prevents the too rapid rise.

The pulsating current is obtained over the following path. From positive battery it passes through the resistance coil B, spring 7, spring 5 to ground at binding post 4, through the ground to line and from there back to binding post 2.

The vibrating magnet A is actuated just exactly the same as is described in the previous cases. The magnet A is wound to a resistance of twelve thousand ohms. The high resistance prevents the rapid deteriorating of the battery, which would be the case if the full voltage were to be used in connection with a coil of fairly low resistance.

### Ninth Michigan Convention.

The ninth annual convention of the Michigan Independent Telephone Association was held at Ann Arbor, March 22-23. The meeting was largely attended and more interest was shown than at any previous meeting. Many of the papers read were crowded out of this issue of SOUND WAVES. The program:

#### THURSDAY AFTERNOON.

"President's Address," E. B. Fisher, Sec'y Citizens Telephone Co.; "Northwestern Ohio," R. E. Hamblin, General Manager Toledo Home Telephone Company; "Concerning Competition," C. B. King, Manager Home Telephone Company, Ann Arbor; "Progress and Prospects," W. O. Hunt, Adrain Mich.; "Progress Traffic Association," W. S. Vivian, Grand Rapids, Manager State Traffic Association; "Our Investments," E. S. Wagar, Banker, Edmore; "The Detroit Situation," W. B. Woodbury, General Manager Home Telephone Co., Detroit.

#### EVENING SESSION.

"A Bit of History," H. H. Hutchins, President Saugatuck Telephone Company; "The Cedar Supply," H. P. Grover, Grand Rapids; "Crowding Collections," F. V. Newman, Manager Grand Rapids Exchange; "Southern Michigan," R. C. Smith, Manager Homer Telephone Company; "The Indiana Outlook," W. L. Moellering, General Manager National Telephone Co., Ft. Wayne; "Ohio's Successes," Frank L. Beam, President Ohio Telephone Association, Columbus.

#### FRIDAY MORNING.

Traffic Association Report, C. E. Tarte, President Michigan State Traffic Association; District Reports,

Vice Presidents of State Association; Treasurer's Report, William Robinson, Muskegon, Association Treasurer; Secretary's Report, J. B. Ware, Grand Rapids, Association Secretary.

### From Council Bluffs to Omaha.

The two steel towers which are to be used in conveying the messages of the Independent Telephone company from Council Bluffs to South Omaha have arrived in Council Bluffs and will be put in position as soon as the condition of the roads south of that city makes it possible to haul the heavy material to their locations. The one for the east bank is to be set up five miles south of town, the one for the west bank near the skimming station at the South Omaha stock yards.

The towers are 100 feet in height and resemble windmill frames. Over them will be strung the steel wires connecting the two cities. Copper wires cannot be used because they would not sustain their own weight by reason of the great distance. The river is about a third of a mile across at the spot where they are to be placed. No cables can be used, because then it would be necessary to have a supporting wire and this would offer such a surface for snow and ice that trouble would be sure to occur during the winter. The wires will be anchored behind the tower and then passed over the top, thus removing most of the side strain, which would otherwise be apt to tip the tower over, no matter how strongly it was founded on its concrete base and supported by its guy ropes.

### Manufacturers at Des Moines.

The following manufacturers were in attendance at the convention: Sandwich Pole Changer Co., Sandwich, Ill.; E. C. Hennis and N. O. Rugh representatives.

International Telephone Manufacturing Co., Chicago. F. A. Middleton and H. H. Davenport, representatives.

Nagel Electric Co., Toledo, O., Harry E. Adams.

United States Coin Register Co., Toledo, O., Gary S. Powell.

Inter-States Supply Co., Sioux City, Ia., F. H. Jones.

Miller Anchor Co., Norwalk, O., G. H. Miller.

Dean Electric Co., Elyria, O., Fred E. Freer.

Electric Appliance Co., Chicago. R. S. Mittin and J. K. Alline, Iowa representatives.

American Electric Fuse Co., Muskegon, Mich. Jas. A. Kinney and G. W. Rordormer.

Illinois Electric Co., Chicago, W. L. Haskell, E. P. Morgan, N. G. Harvey, C. McIntyre and Herbert Moorhouse.

Frank B. Cook, Chicago. Mr. Parker.

Monarch Telephone Manufacturing Co., Chicago, E. E. Yaxley, W. H. Trimm and A. J. Carter, Iowa representative.

Steel Gain Manufacturing Co., Chicago, E. E. Yaxley.

Eureka Electric Co., Genoa, Ill. V. H. Messenger and E. L. Larrabee.

American Steel and Wire Co., Chicago, G. E. Quigley.

Western Electrical Co., Omaha, Neb., William O'Connell.

Baird Manufacturing Co., Chicago, J. W. Harris.

Swedish-American Telephone Manufacturing Co., Chicago.

C. H. Macklin, W. O. Owen, C. L. Ward and F. M. Ferguson, who was called away by the serious illness of his mother at Grinnell, Iowa.

North Electric Co., Cleveland, O. I. J. Kusel.

Monarch Electric & Wire Co., Chicago, H. E. Mason.

Runzel-Lenz Electric Manufacturing Co., Chicago, J. M. Lenz.

Roebbling Son's Co., Trenton, N. J., H. C. Griffen.

Columbian Electrical Co., St. Joseph, Mo., M. I. Blakemore.

American Electric Telephone Co., Chicago, J. C. Henderson.

Geo. B. Roberts and H. B. Hewitt.

Rock Island Pattery Co., Cincinnati, O. W. B. Roberts.

Central Electric Co., Chicago, M. Coulter.

Stramberg-Carlson Telephone Manufacturing Co., Rochester, New York. A. M. Hanbrick and Wm. Bowen.

Nebraska Electrical Co., Omaha, Neb., Al Munro.

Furroughs Adding Machine Company, Detroit, Mich., Messrs. Pender and Pohl.

Standard Underground & Cable Co., Pittsburg, Pa., J. E. O'Neill, Chicago office.

Holden Anchor Co., Des Moines, Ia., E. C. Holden.

# Some Interior Telephone Systems

By CHAS. H. COAR.

In speaking of an interior telephone system one usually has reference to an arrangement of telephones which is confined within a comparatively small area, such as a factory, hotel or apartment house, although the word "interior" is often used in designating such systems as are arranged for inter-communication between a limited number of telephones by means of switching apparatus associated with these telephones, regardless of their location. However, it is customary to confine the lines of an interior telephone system within the space occupied by the firm having the installation with exception of trunk lines which are often operated in conjunction with interior systems and local telephone exchanges in such manner that each or certain telephones of the interior system are provided with central connections.

In the following articles the intention is to describe the operation and circuit arrangement of some commercial types of apparatus.

In Fig. 1, three stations are shown of a system which

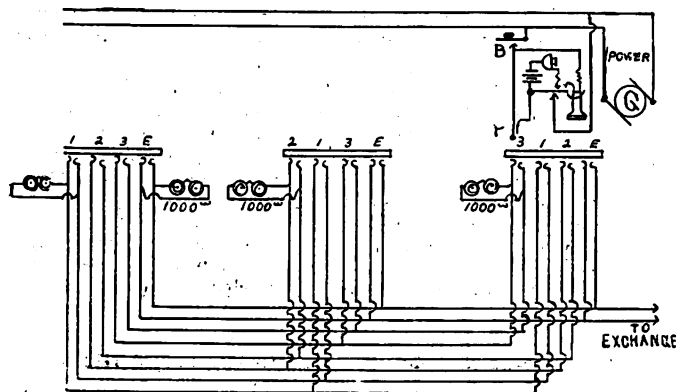


Fig. 1.

is used by several Independent companies. In the circuit shown each station consists of a metallic line which terminates at the remaining stations in two point jacks as shown at 1, 2 and 3. In addition to these lines and jacks there is installed a trunk line to a local telephone exchange, this trunk line having taps taken from it which also terminate in two point jacks located at E in each station of the system as shown.

The telephones of this system (a circuit of one is shown) are designed to operate with local battery and are equipped with induction coils. Each telephone is also provided with a connecting cord and plug P, by which the telephones are connected to the various lines by means of the jacks shown. The telephones are also equipped with a push button or key B, which is utilized in signaling the various stations of the system as follows. Alternating current is obtained from some suitable source, in this instance it is taken from the power generator G and fed throughout the entire system by a pair of conductors from which taps are run to the individual telephones. At each telephone one tap from this ringing circuit is connected directly to the push button or key B, the other tap being connected to a lower switch hook contact as shown in Fig. 1. In calling a station, the calling party places his telephone plug P, into the line jack corresponding to the line of the station desired and presses the button B, which causes ringing current to

flow over this line, thus ringing the 1000 ohm bell permanently associated with this line at the telephone as shown. In this circuit it is necessary that the calling party have his receiver on the hook during calling otherwise no circuit will be provided for the ringing current when the button B is pressed. The trunk line E is equipped with a 1000 ohm bell at station 1, as shown, for receiving incoming calls. It is arranged in this instance, to have an attendant answer all incoming trunk line calls, after receiving which he summons the desired party to the telephone by means of the interior system. The called party can then place himself in connection with the calling party by inserting his plug P, into the trunk line jack E. Such a system is suitable in factories or other places where ringing power is available and has the advantage that it can be operated over comparatively long distances because the telephones are equipped with local batteries and induction coils, and do not depend upon any centralized battery for talking or ringing purposes. It is not necessary to have two wires for conducting the ringing current to the various stations, as this may be done by one wire using the earth as a return. Should this be done the earth connection preferably should be connected to the lower switch hook contacts at the various stations. A bridging magneto generator could be substituted in place of the power generator feeds at each station thus doing away with the power feeds and generator G, if it seemed desirable.

This system has no cross talk or interference from any source for each station has its own individual metallic circuit independent of all other circuits in the system.

The general operating basis of interior systems has in principal kept pace with ordinary exchange development, which according to the best practice makes it desirable to centralize the equipment as much as possible. The local batteries at the telephones are now displaced by a centralized battery at the exchange, of which the telephones are a part.

That the designer has adhered closely to this same feature of interior circuits, will be evident to those read-

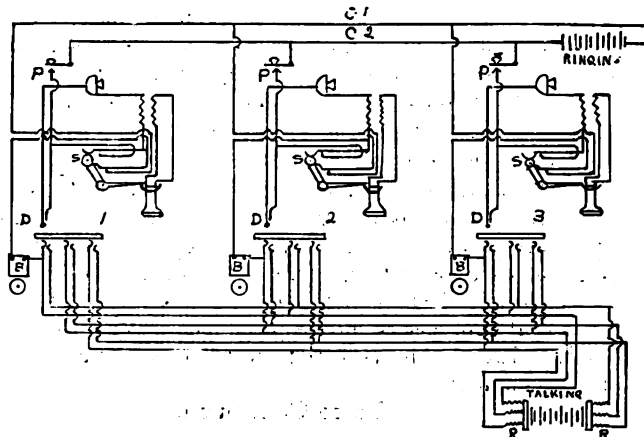


Fig. 2.

ing the descriptions of the circuits to follow. The circuit shown in Fig. 2, was designed for the Stromberg-Carlson Telephone Company and operates from a centralized bat-

tery. In this system two separate batteries are employed, one of which is used for ringing the bells of the various stations while the other is utilized for talking purposes and is termed the "talking" battery as shown in Fig. 2. In this circuit three stations are shown, each station being equipped with a specially designed switch hook S, also a push button P, and a vibrating bell B, in addition to the transmitter, induction coil and receiver. Each telephone is also equipped with a strip of jacks one for each line of the system which furnish the means making the various connections during operation.

In this system two calling wires C<sub>1</sub> and C<sub>2</sub> are installed throughout the system, taps being taken off at each telephone, one of which terminates in the push button P, and the other at the bells B at each station after passing through switch hook contacts at these stations.

The lower contacts of the push buttons P, are permanently connected with the sleeve conductors of the telephone plugs D, while the remaining bell terminal at each station is connected to the sleeve spring of the line jack representing the station that the bell calls as shown in the circuit diagram. The operation of these bells will be taken up later. Each line conductor of the stations shown is permanently connected to the centralized battery through a retardation coil R, in such manner that the talking battery for each station flows out over one conductor and returns by the other. Thus each line secures its battery for talking purposes through retardation coils and therefore during conversation between any two telephones of the system the telephones would receive their current supply from the line to which they were connected. To aid in further description of this current, let us assume that a party at station 1, in Fig. 2, wishes to talk to a party at station 3. The calling party at station 1 would place his telephone plug D into number 3 jack at his station and press the ringing button P which causes ringing current to flow from the positive side of the ringing battery through the ringing button and sleeve conductor of the plug D and jack 3, thence over this wire up and through the bell B of station 3 to the negative pole of the ringing battery, thus completing the circuit and ringing the bell which summons the called party. The calling party can call with his receiver off the hook but it is necessary that the receiver be in place at the called station in order that the bell circuit of this station will be continuous through the switch contacts. When both parties are in communication in this instance the telephones will receive their talking current in multiple through the permanent battery taps to line 3. As shown in the circuit diagram the receivers at each station is in a purely local circuit consisting of the secondary of the induction coils and receivers.

Such a system should operate very well as there are no common returns in circuit during talking and also as the battery taps for the various lines are made through retardation coils, which would tend to prevent any cross talk. It would aid in evening the talking battery supply if several condensers were placed in multiple across the talking battery as is often done in systems operating in this manner.

To be Continued.

The Happy Valley Telephone Company of Anderson, Cal., has elected the following officers: President, M. A. Batson; vice president, S. Hilton; secretary, L. D. Walker; treasurer, A. L. Walker.

## Book Reviews.

(Electric Wiring, Diagrams and Switchboards, by Newton Harrison.)

There has been recently published a neat and comprehensive volume on power switchboards, under the above title.

The author gives the completest explanations of the mode of wiring for both electric light and power circuits. There is no deep discussion of the mathematics of calculation but everything is given in the simplest language with as little mathematics as possible. The wiring for both alternating and direct current work is explained.

Circuits showing the arrangement of the conductors of power switchboards are fully shown and explained in detail.

There is a good field for just such a work, as the average wireman has but little idea of the reasons for the running of electric circuits as they should be. There are very few books which attempt to give an adequate idea of the proper way to build a switchboard. This book should be in the library of all those who are interested in the proper construction of electrical systems.

The book is published by The Norman W. Henly Publishing Company, New York. It has 272 pages and the price is \$1.50.

(Wireless Telegraphy, by Gustav Eichhorn, Ph. D.)

Nowadays when there are many kinds of wireless telegraph systems on the market, one hears only of systems as related to one or another company or inventor. It seems as though there is but little unbiased writing. Dr. Eichhorn has written his book without reference to any particular system except that he may have to mention it to make the text more full. In other words the book is an explanation of the theory of wireless telegraphy.

The author goes quite deeply into the mathematical principles and explains the actions which take place during the sending of a message. While there is considerable analytical discussion, there is still much that can be read with interest by one who is not familiar with the higher branches of mathematics.

The book has 116 pages and 79 illustrations. Price \$2.75 net. The publishers are Chas. Griffin and Company, Limited, London, and J. B. Lippincott Company, Philadelphia.

## George Ade on German Telephones.

George Ade who is now "doing" Europe has the following to say of the telephones on the German steamship upon which he took passage. This is the way he tells it in the Chicago Tribune:

"A telephone is placed in every room, connected with a central station. The passenger never uses it, because when he is a thousand miles from the shore, there is no one to be called up, and if he needs the steward he pushes the button. But it is there—a real German telephone, shaped like a broken pretzel—and any one who has a telephone in his room feels that he is getting something for his money.

After two or three lessons any American can use a foreign telephone. All he has to learn is which end to put to his ear and how to keep two or three springs pressed down all the time he is talking. In America he takes down the receiver and talks into the 'phone. Elsewhere he takes the entire telephone down from the rack and holds it the same as a slide trombone.

In some of the cabins were electric hair curlers. A Cleveland man who wished to call up the adjoining cabin on the phone just to see if the thing would work, put the hair curler to his ear and began talking into the dynamo. There was no response, so he pushed a button and nearly ruined his left ear. It was a natural mistake. In Europe, anything attached to the wall is liable to be a telephone.

On the whole, I think our telephone system is superior to that of any foreign cities. Our telephone girls have larger vocabularies, for one thing. In England the hello is never used. When an Englishman gathers up the ponderous contrivance and fits it against his head he asks, "Are you there?" If the other man answers 'no' that stops the whole conversation."

The Citizens' Telephone Company of Grand Rapids, Michigan, is making a desperate fight with the Bell for possession of small Independent telephone companies in the state.

# Some Ideas of Telephone Currents

By G. W. WILDER.

When a current is broken it is evident that before it can cease flowing all of the energy stored up in the magnetic field surrounding the conductor and the magnets must be returned to the circuit. This can not be done instantaneously any more than it could be placed in the field without any expense of time. Consequently the magnetism tends to prolong the life of the current and keep it flowing in the circuit. This prevents then, a sudden interruption of the current and gives it a tendency to produce a spark or flame across the ends of the wires when they are separated or between the points of the key contacts when the latter is released. This accounts for the sloping of the current curve in the figures shown in the April number of this magazine and is much more pronounced when the circuit contains considerable magnetism.

The magnetism built up around a circuit by the current gives an inertia effect to it and behaves just like mass does to matter. We all know that it takes more force to set a body in motion than it does to keep it going when once started also that a moving body requires some energy to stop it or as physics teaches us, bodies at rest tend to remain at rest while bodies in motion tend to keep in motion. This may be illustrated in our water analogy given in April number of this magazine, by supposing a partition to be inserted the motion of the water tends to break through the partition and keep right on in its course. After having once stopped the motion of the water in this way it will take some little time for the fact that the water has inertia. It might be even suggested that the water would pile up against the partition for an instant when the latter is let down and in fact to such an extent that its level becomes higher than that produced by the moving wheel. This explains the fact that when a circuit is broken the electrical pressure at the points of separation suddenly rises to a great value, causing a sparking effect that sometimes becomes a serious problem to deal with. In high tension power work a good deal of thought has been put on the subject of circuit breakers which will allow a circuit to be broken without disastrous effects being produced.

A fluctuating current is one in which a steady flowing direct current is fluctuated in strength without actually breaking it. This may be done in a variety of ways but is usually accomplished by changing the resistance of the circuit in some manner. In a telephone circuit consisting of a transmitter in series with a battery and line wires the transmitter acts as the variable resistance, Fig. 6. The battery causes constant current to flow through the circuit which normally is quiet and steady. Sound waves directed against the diaphragm

of the transmitter causes the latter to vibrate and exert varying degrees of pressure against the carbon particles forming the variable portion of the circuit. Since the re-

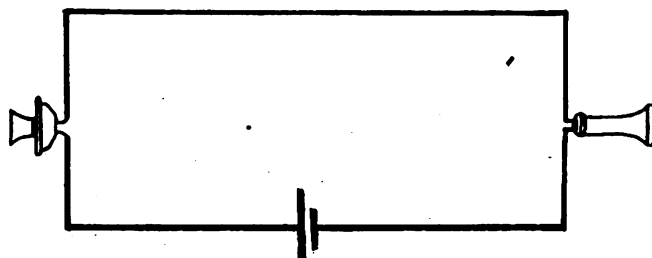


Fig. 6.

sistance of the carbon particles depends upon the pressure with which they are packed together, a change in this pressure causes a corresponding change in their resistance and hence a change in the entire resistance of the circuit. This action causes a fluctuation of the current, although rarely is the current ever broken completely. In general these fluctuations are small in amplitude compared to the strength of the battery current and may be likened to ripples upon the surface of water. Figure 7

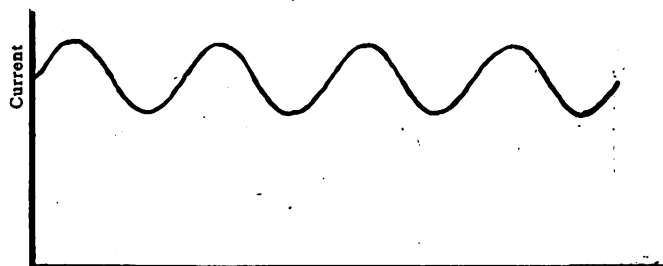


Fig. 7—Fluctuating Current Curve.

shows the form of such a current when the fluctuations are uniform such as would be produced by a tuning fork vibrating in front of the transmitter or by a person singing a note. A combination of sounds such as are produced in speaking will give complicated variation to the current such as shown in Fig 8.

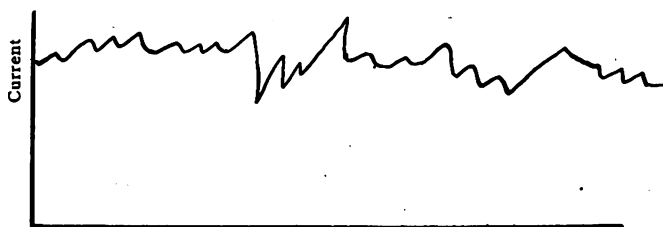


Fig. 8—Current Curve Due to Talking.

These fluctuations which are superimposed upon the main current do not travel out from the transmitter in one direction only, as a battery current is thought to do, but on the contrary they go out in each direction over the circuit. According to the water analogy taken above they act like ripples which travel out in both directions



around the canal. In the case of a body of water like a mill pond, ripples will travel until they die out, owing to the viscosity of the water or until they reach the shores of the pond. In this respect they act like the fluctuations placed upon a battery current in a telephone circuit. The viscosity of the water corresponds to the resistance of the conductor and when this is great enough the fluctuations die out and we say that the resistance of the line is so great that the energy due to the transmitter is all absorbed, leaving nothing to be picked up at the far end of the line by the receiver. It is these fluctuations caused by the transmitter that actuate the receiver and are reproduced by it. Technically, they are commonly known by the name of VOICE currents and also as TELEPHONIC currents. One of the great problems of long distance telephony is to find some means whereby these fluctuations may be transmitted over any length of line with such force that they will actuate a receiver. Not only does the resistance of the line absorb these currents but other properties tend to change the form of the waves so that often it happens that a telephone current will arrive at the receiver with force enough, but will be so changed in character that all articulation is lost and consequently the speech is intelligible. This is especially true when the current must traverse various instruments in the intervening distance.

An alternating current is a current which periodically changes its direction. A battery current may be changed into an alternating one by using some device that will reverse the poles at regular intervals, thus allowing the current to flow in one direction for a short period of time and then to flow in the opposite direction. Such a current is shown in Fig. 9. Usually such a cur-

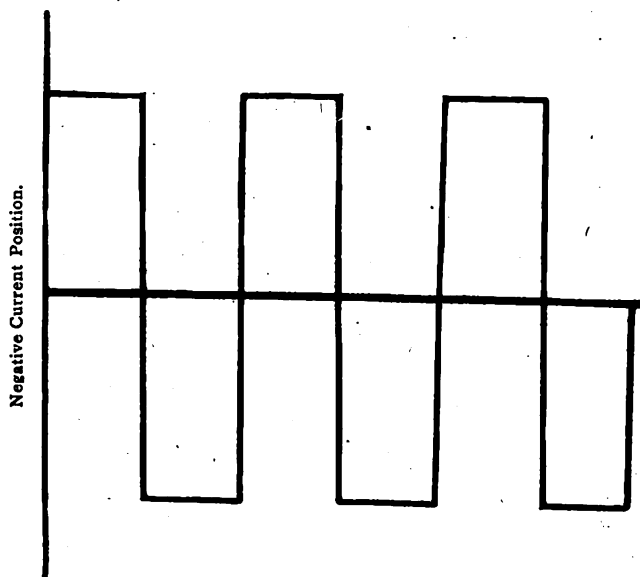


Fig. 9.—Alternating Current Curve.

rent is produced by a machine which is constructed in such a manner that the current is always changing in value and never remains constant. A curve showing such a current and known as the typical alternating current is shown in Fig. 10. This type of current is used in telephone work mostly for signalling purposes; a dynamo machine located at the exchange is switched onto

the line wires whenever a subscriber is to be called and the alternating current operates the bells at the distant telephone. In magneto systems each subscriber has a small machine in his telephone which answers the same purpose when a subscriber wishes to call up central. In these latter systems the telephonic currents are also alternating in their nature as will be pointed out later on.

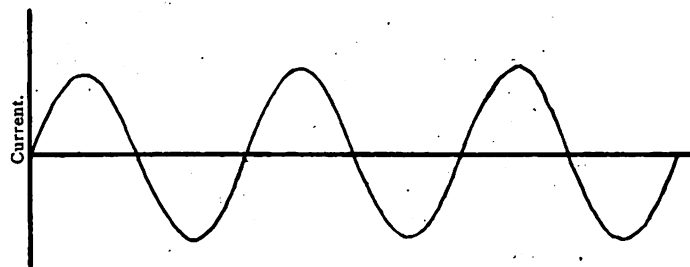


Fig. 10.—Ideal Alternating Current Curve.

Alternating currents are used on a large scale in electrical work especially in the transmission of power over long distances. It is found to be more economical to use high pressures and these can be obtained only by using such currents.

The alternating current may be illustrated by the water analogy taken above by assuming the wheel to be given a vibratory motion instead of a motion in one direction as is the case when a direct current is illustrated. Suppose the wheel to be turned backwards and forwards with regularity, then the water in the canal will surge to and fro but will not actually move along the canal. It is evident that this rocking motion would tend to set other wheels to going in the same manner were they placed along the canal. Each wheel would pick up this swinging motion and be capable of giving off energy and we see that it is not necessary for the current of water to flow constantly in one direction, but that a surging effect will also transmit energy.

(To be continued.)



The above used through the courtesy of the Canadian Municipal Journal shows graphically the attitude of the Canadian people toward the Bell. Mr. Sise is president of the Canadian Bell. Stand firm, brother.

# Construction of the Ideal Exchange

By G. J. NEWTON

Before proceeding to the actual construction it may be well to offer a few suggestions that will prove of value; a suitable place for a store room must be chosen and care is necessary in its choice; too often a dark inconvenient place is considered good enough, only to be regretted later. Choose rather a clean, light place, having ample room and make bins and shelves to store the material so that each kind is kept separately; install a storekeeper who is competent to take proper care of it and insist on "having a place for everything, and everything in its place."

The next important matter to consider is a complete system of reports that will show at all times the work being done, material used and material on hand; in making up the forms for these reports it is best to make them as simple as the case will permit. An elaborate system requires a large amount of bookkeeping and is rarely maintained for any length of time, whereas simple plain reports are easily made out and will give ample information in regard to the work.

These reports should be made out daily by the foreman in charge of each crew and turned in the following

THE CITIZENS TELEPHONE CO.

DAILY REPORT.

.....190..

Work Done .....

Material used .....

Livery .....

EMPLOYEES		
.....	.....	.....
.....	.....	.....
.....	.....	.....

.....Foreman.

Fig. 1.

morning. The report shows date, work done, material used, teams employed, men on the work and foreman in charge; from this report the men's time can be taken, material checked and livery bills verified.

On this report is entered the total of the material used for the day as reported on the various daily reports of the different foremen. One of these reports is

THE CITIZENS TELEPHONE CO.

MATERIAL USED.

.....190..

LINE.	INSTRUMENT.	
.....	.....	.....
.....	.....	.....
.....	.....	.....

Fig. 2.

attached to all the daily reports for each day and makes a complete record for that day.

This report is made up from the daily material re-

MATERIAL REPORT.

Month of January, 1906.

J. H. WHITE,

Sup't.

	25 in. Poles	30 in. Poles	10 Pin Armes	28 in. Braes	Pony Glass	No. 10 Copper Wire Miles	Wall Sets	N. D. Sets
On hand first of January, 1906..	240	150	500	1090	3500	74	210	73
Rec'd from Requisitions.....	132	64	200	.....	700	.....	6	4
" " Disconnections.....	.....	.....	.....	.....	.....	.....	3	.....
" " Changes.....	.....	.....	.....	.....	.....	.....	.....	.....
Total to be accounted for.....	372	214	700	1090	4200	74	249	74
1	20	4	28	56	280	.....	3	1
2	10	15	40	80	400	.....	6	2
3	.....	.....	.....	.....	.....	.....	4	.....
4	.....	.....	.....	.....	.....	.....	7	1
20	30	10	60	120	600	.....	7	2
30	10	4	20	40	200	10	8	4
31	3	6	9	18	90	2	12	3
Used during month.....	73	39	157	314	1570	24	47	13
" on Changes.....	.....	.....	.....	.....	.....	.....	.....	3
Transferred to L. D. Line.....	100	40	280	560	2000	30	.....	.....
" ".....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
Total expended.....	173	79	437	874	3570	54	47	16
Total on hand February 1, 1906.	199	135	263	216	630	20	202	61

port and is ruled as shown in the sample except that there is one line for each day of the month.

Figs. 4 and 5 are the line and instrument orders respectively and the method of filling them out will be readily seen from the wording. The Installer, by presenting his order to the storekeeper can receive the necessary instruments for each station, thus saving an additional requisition blank and clerical work; the contract, line and instrument orders should all have the same number and when completed should be filed together for future reference.

## THE CITIZENS TELEPHONE CO.

## LINE ORDER.

.....190..  
 No..... Rate.....  
 Name.....  
 Address.....  
 Foreman .....  
 .....  
 ..... Sup't.

CABLE NO.	PAIR	LOCATION OF TERMINAL
.....	.....	.....

## MATERIAL USED.

.....  
 Date completed .....  
 Time .....  
 ..... Foreman.

Fig. 4.

If these different forms are printed on different colored paper it will be an advantage. These reports, excepting the monthly material report, may all be printed on cards and filed as a card system in boxes. That, however, is a matter that can be arranged to suit the individual user.

## THE CITIZENS TELEPHONE CO.

## INSTRUMENT ORDER.

.....190..  
 No..... Rate.....  
 Name.....  
 Address.....  
 The following instruments are to be placed at this address:  
 .....  
 .....  
 ..... Sup't.

## MATERIAL USED.

.....  
 .....  
 ..... Installer.  
 Date installed .....  
 Date connected .....  
 Entered on records .....  
 Tested "O. K." .....  
 ..... Chief Op'r.

Fig. 5.

[NOTE.—Reader will please bear in mind that in the accompanying blanks, Figs. 4 and 5, all extra blank lines have been omitted.]

To do good work and produce satisfactory results it is absolutely necessary to use the best of material and tools and employ experienced men in the construction and maintenance of a telephone system. "What is worth doing at all is worth doing well" never applied to any business more than to the telephone business, frequently people who organize a company think they are competent to direct its construction; sometimes they are, but more often the result is a discredit to themselves and a losing investment to all concerned, the safest way is to secure the services of a competent man, give him full charge, demand results and see that you get them.

## PREMIUM ON MARCH NUMBERS.

Although a thousand extra numbers of the March issue of "Sound Waves" were printed, the last one has left our offices, both at Chicago and Logansport, Ind., and still the demand continues. To those who are not keeping a file the publishers offer a premium of three months' extension in subscription for each number so sent to our Logansport office.

## An Interesting History.

The York County Telephone Company, authorized capital one-half million dollars, with the principal office at York, Nebraska, furnished their subscribers and others with quite a detailed account of the business of this company, its history and other features of an entertaining nature in pamphlet form recently. An interesting account is given therein of how this company happened to be organized, it being like many other institutions of merit, simply a product of the necessities of the times. The Nebraska-Bell-Telephone Company has been in York County since 1887, building there only when the citizens had bought enough of their stock to pay a large share of all of the cost. The affairs of that company were then so manipulated that no dividends were paid for a number of years, or until after nearly all of this stock, which had cost York people \$100.00 per share, had been bought up by emissaries of the management at prices as low as \$40.00 per share. The service was limited and the exorbitant price of \$90.00 a year for residence and business 'phones was charged, and they refused to build farmer lines at all. The demand, though, for 'phones finally came and this unsatisfactory condition of affairs was eliminated by the organization of the York County Telephone Company, and since then conditions have been different. This company now has an average of forty persons employed, nearly 600 stock-holders in York County; have not sold a share of stock below par, and the president of nine of the thirteen banks in York County are stock-holders. In Nebraska there are not less than 35,000 subscribers of Independent 'phones.

SOUND WAVES is pleased to acknowledge receipt of a four-page folder issued by the Swedish-American Telephone Company, being a talk of Individuality relating to their product. The folder is unique in design and printed in a manner decidedly original.

# Talks and Queries

## READERS, PLEASE NOTE

A large proportion of our readers end in queries without inclosing stamps, requesting that we answer by letter. We are glad to answer their inquiries so that they need not wait until the next issue for reply, but we must insist that postage stamps be inclosed, otherwise the queries will remain unanswered. Several have asked questions that would require a volume to answer, and in these cases we will have to refer the writer to books relating to the subject. We are sure that our readers will not feel offended if we do not go into elaborate details when the information can be found in standard telephone literature, written better and more plainly than we can explain it.

EDITOR SOUND WAVES:—It may be of interest to some of the readers of SOUND WAVES, to know that a pole changer may be run by means of a storage battery and automatically started and stopped by means of extra springs either on the master keys or on the regular ringing keys.

Wires from the vibrator battery are run through these extra contacts and then every time the ringing key is operated the current from the vibrator battery is thrown on. By this arrangement the current is not wasted and then there are convenient means for the recharging of the battery every time it runs down. A comparatively small resistance should be placed in series with the storage cell as the voltage is higher than that of the Edison battery usually used in connection with the Warner pole changer.

Two of our pole changers have been wired like the above for nearly a year and have been giving the best of results. We operate the night bell from the same battery.

I might add that the cell is normally disconnected from the main battery, being in series only when charging.

J. V.

For the information of those who do not have storage batteries, we wish to say that an ordinary dry battery will also do the same work if wired through the ringing keys. The reason that the pole changer is sent out complete is because the average exchange workman does not care to undertake the rewiring of his board to save the expense of a vibrator battery.

EDITOR SOUND WAVES:—Will you kindly publish in the columns of your valuable journal a detailed description of the device known as a kick coil? I cannot find it described in any of my electrical books, or in the electrical dictionary. I have seen this device mentioned in one of the magazines, as having .7 of an ohm in the primary winding and 170 ohms in the secondary. This would appear to me as nothing more than an ordinary induction coil, but the same article particularly stated that an induction coil would not answer the purpose.

The magazine article then went on to describe the construction of the device for ringing the ringers in telephones. If you can and will give this question consideration in your query column, you will greatly oblige myself and perhaps others?

Answer.—You are right, the kick coil is nothing more or less than an induction coil. It is designed on different lines from a telephone induction coil, but it is none the less an induction coil. The kick coil is made with a much larger amount of iron in its core, and is much larger and heavier in every way. When used for signaling, a cur-

rent from a battery of low tension, like the battery of a telephone, is for a moment discharged through the primary winding. This momentary current induces a current in the secondary, of high voltage. If you were to have hold of the terminals of the secondary winding you could appreciate why it is called a kick coil. The current is of very short duration and amounts to a mere kick.

Another kind of kick coil is the ordinary spark coil used in gas lighting work. This coil is wound over a heavy core of iron wire. There is but one coil and the kick comes upon the breaking of the circuit.

EDITOR SOUND WAVES:—We have a metallic circuit line about thirteen miles long which at times works well and then again becomes noisy, making a grating noise while talking. A sound like the ticking of a telegraph instrument is also heard at times. It is to be noted, that the line for ten miles runs along a telegraph line (for three miles about fifteen feet away and for seven miles about 150 feet apart). For three miles there are other wires on the poles, six telephone wires and one common return. The metallic line is transposed at intervals of about 1,400 feet.

At one end of the line the metallic circuit runs on a ten pin arm along side of the seven other line wires and the common return, two hundred feet of which distance there is no transposition. The line is apparently all right except that there are several insulators broken off.

Now would the four insulators being broken, be sufficient to cause the grating noise and the clicking? Or could the trouble be traced to the transposing on the three mile lead with the other wires? Where shall I look for the trouble?

Answer.—Look for grounds by all means. The grating noises on a metallic circuit is usually caused by the passage of some foreign current. Of course the improper transposing of the line would be responsible for some disturbance but hardly from the parallel telephone lines in your case. If the metallic line is not transposed properly with respect to the telephone lines, you would hear cross talk between them. You may hear induction from the parallel telegraph lines but not sufficient to disturb the telephone line, if the transpositions are made nearly correct.

Carefully examine your lightning arrestors and see if you do not find one or more of them grounded. If you were to have a ground at each end of your line the telegraph return current would, without a doubt pass over your circuit and cause your trouble. Your broken insulators may allow the wire to fall upon a guy and thus your system would be grounded. It takes but one ground to completely upset a metallic circuit line. Do not let even a twig or a leaf touch the wire and then you will find that the limbs do not touch. If you have limbs on your lead, you had better trim them now, while they are bare, for after the leaves come out, the owners might object.

EDITOR SOUND WAVES:—I work for a telephone company and have not had very much experience in setting up a desk 'phone, would like for you to describe the wir-



ing and circuits. We use the full metallic circuit. We also have a Warner generator and are having trouble with it. We have had it about six months and it rings our longest lines all right if we let it rest awhile, and then it will get weak again. I took the wet cells off and examined them and found one or two bad ones, but all the rest seem to be all right. There are about seventy-five wet ones and forty-five dry and it still runs down. Would feel very grateful to you if you can inform me in either case.

Answer.—In the setting up of your desk telephone, you had better consult the manufacturer. He will have all the necessary instructions for the connection.

As for your pole changer, the trouble is in the battery without a doubt. The fact that the battery requires a rest after each ring proves that. We would suggest that you get a battery gauge and see if they all are in shape to do their work. If you do not have the gauge try an electric door bell. Adjust the bell so that it will ring when connected with a good cell of battery, then try it on each cell in the series. The adjustment should be made so that the movement is not too stiff so as to allow a margin for a certain amount of weakness in the ringing cells. You will probably find a number of cells in the battery that will not ring your bell because of the high internal resistance. Their resistance is so high that the current from the other cells cannot pass through in sufficient quantities to signal properly.

Editor SOUND WAVES:—We have a telephone line five miles long, metallic circuit No. 12 B. B. iron wire on which we have 14 telephones installed. We have the lightning arrestors and the 'phones each connected to a ground wire. The lightning arrestor is that which is known to the trade as the 3400. Now what I want to know is, why I can ring all the rest of the phones on the line and talk well when I remove the line from the left hand binding post of the telephone and connect that post to the ground. Will you kindly advise me why this is and, if not right, what is the remedy? The line is giving fairly good service and I can vouch for the lightning arrestors on the 'phone as I have connected as above. I am a constant reader of your valuable paper.

Answer.—There is a ground on the line that was disconnected from the binding post of the telephone. The ground may not be at your instrument, but is either at some other telephone or out on the line somewhere. When you ring, your generator current passes out over one side of the line that is connected to your telephone through the other instruments on the line to the ground mentioned above and then back to your instrument. The problem is for you to find where the ground may be located. Probably the trouble is in one or more of the lightning arrestors.

Editor SOUND WAVES:—I am a trouble hunter and have been having a great deal of trouble in the service by the cutting in and out of conversation. Everything will stop dead for a few moments and all at once it will come back again bang up. I have been able to remedy it for a little time, but as yet have not been able to find a satisfactory permanent remedy.

We have a Western switchboard and a variety of instruments attached on this exchange. I would be much

pleased if you can give me any information to help find the trouble?

Answer.—Bad circuits of course. The trouble looks very much like cord or key trouble. After cords have worn awhile they need cutting back next to the plugs. The tinsel wears out from constant handling and this causes the transmission to cut off in the manner that you have described. To test for this trouble, do not use a generator for you will get a clear test every time on a poor cord. Connect a cell of dry battery on a vacant jack, being sure to disconnect the drop. Insert the plug in this jack and then open the key so that you may listen in on the circuit. Now shake the cord and see if you do not hear a disagreeable scratching noise. Such noise indicates a bad cord. It is easy to tell what parts of the cord are bad by shaking only portions. Generally it will be found that the trouble is next to the plug. Cut back the cord to a point beyond the bad place and it will then be all right. Cords should be tested by this method every morning.

Carefully examine every key contact and see if there can be bad contacts or contact points that are corroded.

If the trouble is not found in the switchboard, the only hope is to go out after the bad joints in the line.

We would suggest that you look for wornout jacks in the board.

In another column is a communication signed "Illinois," which gives another opinion on soliciting business in the Independent exchange. It has occurred to the editor to ask whether the writer of the communication has competition in his town and how much. Sometimes a hustling management in a town having no competition may work up a fine business because of the fact that the charges are low and the service good. We hardly think that it is desirable to limit the size of the exchange in any community. Of course it might be a good thing for the manager to sit down and rest on his laurels, but it would not take long for the people to forget him when a new and hustling competitor came in.

The record of one telephone to each nine people is certainly good but not at all unusual. "Illinois" might be surprised to learn that there are exchanges that have as good a ratio as one to five, and a few that have a ratio of one telephone to three people. Given hot competition and an exchange that has supplied the apparent need of the town and we think that "Illinois" will agree that the solicitor is a very apparent necessity.

Editor SOUND WAVES:—Are solicitors necessary in establishing a telephone system? As far as the big exchanges are concerned, I cannot say—for the smaller exchanges, most certainly not. At the present time we have waiting about 25 orders to fill, and we have not solicited a single one. Our exchange has grown from the original installation, the only time we solicited orders, over 2,200 per cent, and the principal trouble we have had is digging up the requisite funds to buy apparatus, etc. We have increased our capital stock \$13,000 to meet the requirements of new business, and have spent over \$7,000 more out of the earnings of the company, and are still 25 orders behind, with three farm lines to build in addition to the exchange lines. It takes all our money to take care of extensions, and then we are months filling some orders. Do we need a solicitor? We need some one's

advice as to the proper way of avoiding orders until we can fill them promptly.

What could be nicer than to have an exchange of 300 subscribers, never move a telephone, never lose a subscriber, and never receive another order. Would you want a solicitor?

The solicitor that gets the orders is good service. Here is our proposition to our subscribers. "If you can show us an exchange anywhere that gives as good service as we do for less money, or better service for the same money, we will give you one year's telephone service free." We claim to give first-class telephone service. This service brings in orders faster than we can fill them. We have a telephone installed for every nine inhabitants in the city, and a number of unfilled orders. Do you think a solicitor would be of any value to us? The average small exchange will welcome the information how to avoid orders until you can fill them promptly, instead of the advice to employ a solicitor. The managers who are wondering how to keep up with orders exceed greatly the managers who are worrying because no new orders are being received.

The writer knows nothing of the value of a solicitor in large exchanges. He will bet a cookie, however, that a vast majority of managers of medium and small exchanges spend more anxious thought about the abundance of orders, than about the lack. Will some good brother come forward and tell some way we can follow, which will result in our keeping all of our present subscribers satisfied, and still not create a desire for a telephone in some non-subscriber's mind? We would like to quit growing for awhile, but don't want to go back any. And a whole lot more feel like we do. Who will point out the way?

ILLINOIS.

### Ohio Independent Telephone Association at Columbus, Ohio, March 29, 1906.

#### List of Delegates and Visitors who Attended the Annual Convention.

Ben. Ames, Mt. Vernon, O.; F. W. Aldiger, Logan Home Tel. Co., Logan, O.; S. H. Allen, Oxford Telephone Co., Oxford, O.; E. C. Ammentrout, Bluffton Tel. Co., Bluffton, O.; E. O. Arnold, Mt. Vernon Tel. Co., Mt. Vernon, O.; J. S. Anderson, Citizens Tel. Co., Delaware, O.

John T. Barlow, Home Tel. Co., Dayton, O.; E. L. Barber, Central Tel. Con. Co., Wauseon, O.; W. H. Bailey, Auglaize Tel. Co., Waynefield, O.; C. A. Barber, The Payne Home Tel. Co., Payne, O.; W. H. Baum, New Citizens Tel. Co., Batavia, O.; C. F. Barnes, Col. Citz. Tel. Co., Columbus, O.; B. J. Balliett, Mansfield Tel. Co., Mansfield, O.; Geo. W. Beers, Queen City Tel. Co., Cincinnati, O.; Frank L. Beam, Ohio Ind. Tel. Assn., Columbus, O.; H. L. Beatty, Portage Co. Tel. Co., Ravenna, O.; S. A. Blessing, W. Milton Home Tel. Co., W. Milton, O.; Frank Binkley, Valley Tel. Co., Lebanon, O.; C. R. Bleakney, Sidney Tel. Co., Sidney, O.; R. W. Boyd, London Home Tel. Co., London, O.; Wm. Bogardus, Mt. Vernon Tel. Co., Mt. Vernon, O.; W. H. Bowron, Noble County Tel. Co., Caldwell, O.; J. C. Bright, McComb Home Tel. Co., McComb, O.; Geo. Bracht, Col. Citz. Tel. Co., Columbus, O.; James M. Beem, Ada Tel. Ex. Co., Dunkirk, O.; E. W. Breece, Mt. Vernon Tel. Co., Mt. Vernon, O.; C. L. Baucher, U. S. Tel. Co., Toledo, O.; James S. Brailey, Jr., Toledo Home Tel. Co., Toledo, O.; D. Bradley, U. S. Tel. Co., Dayton, O.; J. E. Bailey, Toledo Home Tel. Co., Toledo, O.; Lewis Brucker, Mansfield Tel. Co., Mansfield, O.; B. H. Brooks, Columbus Citizens Tel. Co., Columbus, O.; J. F. Brown, Carey Electric Co., Carey, O.; J. A. Brown, Eastern Ind. Tel. Co., Winchester, Ind.; Thos. Brownley, Farmers & Citz. Tel. Co., Frankton, Ind.; J. C. Boush, U. S. Tel. Co., Cleveland, O.; H. S. Burton, Shade Tel. Co., Shade, O.; D. J. Burnham, Mechanicsburg Tel. Co., Mechanicsburg, O.; H. R. Butler, Ada Tel. & Ex. Co., Ada, O.

C. R. Callaghan, Local Telephone Co., Bellevue, O.; O. M. Carter, Western Electrician, Cleveland, O.; W. S. Carpenter, Citizens Telephone Co., Circleville, O.; E. L. Carter, W. Rich-

field Tel. Co., Richfield, O.; W. L. Cary, Jr., Federal Telephone Co., Cleveland, O.; Geo. W. Carter, Citizens Telephone Co., Delaware, O.; F. B. Chester, Wood County Tel. Co., Bowling Green, O.; L. D. Cenkey, Marshfield Tel. Co., Marshfield, O.; W. E. Clark, Amesville Tel. Co., Amesville, O.; E. L. Coen, Vermillion Tel. Co., Vermillion, O.; J. G. Collin, Logan Home Tel. Co., Logan, O.; Henry A. Clark, Ada Telephone Co., Ada, O.; P. H. Cohey, Urbana Tel. Co., Urbana, O.; W. A. Cosgrave, Riverside Tel. Co., McConnellsville, O.; C. D. Conners, Flushing Tel. Co., Flushing, O.; C. E. Cox, Eaton Tel. Co., Eaton, O.; Geo. Culam, M. W. & O. Tel. Co., Millersburg, O.; R. M. Critchfield, Johnstown & Croton Tel. Co., Mt. Vernon, O.; A. J. Curren, Elyria Tel. Co., Elyria, O.; S. W. Crosby, Ashtabula Tel. Co., Ashtabula, O.

A. C. Davis, Marietta Tel. Co., Marietta, O.; Wm. Day, Bradford Home Tel. Co., Bradford, O.; Stephen Day, Bradford Home Tel. Co., Bradford, O.; Frank A. Davis, Columbus Citizens Tel. Co., Columbus, O.; H. T. Dalrymple, Monroe Co. Tel. Co., Mt. Gilead, O.; H. C. Dean, Springfield Xenia Tel. Co., Xenia, O.; J. A. Devore, Bryan Tel. Co., Bryan, O.; Harry C. Devin, Mt. Vernon Tel. Co., Mt. Vernon, O.; J. C. Dow, Carey Electric Co., Carey, O.; A. H. Doudna, Belmont Tel. Co., Bridgeport, O.; B. D. Doan, Young Hickory Tel. Co., Young Hickory, O.; Chas. D. Duncan, Home Tel. Co., Chillicothe, O.; Chas. Dumbaugh, Morrow Co. Tel. Co., Mt. Gilead, O.; G. N. Deffee, Athens Home Tel. Co., Marshfield, O.; A. H. Elmore, Sandusky Tel. Co., Sandusky, O.; J. P. Eaton, Ohio Valley Tel. Co., Proctorville, O.; L. D. Eaton, Ohio Valley Tel. Co., Proctorville, O.; J. F. Engle, North Electric Co., Cleveland, O.

Wm. R. Fee, New Citizens Tel. Co., Milford, O.; Howard W. Fenhner, Auburn Tel. Co., Auburn, N. Y.; L. W. Fawcett, United Telephone Co., Bellefontaine, O.; C. R. Fisher, Clinton Tel. Co., Wilmington, O.; W. W. Fisher, United Tel. Co., Bellefontaine, O.; O. F. French, Cuyahoga Tel. Co., Cleveland, O.; D. E. Fuller, Clyde Tel. Co., Clyde, O.; A. M. Fudge, Preble Co. Tel. Co., W. Alexandria, O.; H. P. Folsom, Citizens Tel. Co., Circleville, O.; S. N. Ford, Mansfield Tel. Co., Mansfield, O.

Frank L. Gee, Maumee Tel. Co., Maumee, O.; Amos A. Gergin, United Tel. Co., Bellefontaine, O.; L. E. Gardner, Bryan Tel. Co., Bryan, O.; H. F. Graves, Carey Electric Tel. Co., Carey, O.; Sherman M. Granger, Zanesville Tel. Co., Zanesville, O.; H. E. Graham, Oil Belt Tel. Co., Cygness, O.; C. R. Graham, Oberlin Tel. Co., Oberlin, O.

W. W. Hamilton, Washington Home Tel. Co., Washington, O.; R. E. Hamblin, Toledo Home Tel. Co., Toledo, O.; H. E. Hageman, Black River Tel. Co., Lorain, O.; F. J. Hanna, Home Tel. Co., Dayton, O.; L. D. Hagerty, Columbus Citz. Tel. Co., Columbus, O.; Frank Hart, P. & A. Telephone Co., Pittsburg, Pa.; J. A. Harney, National Interstate Tel., Cleveland, O.; W. Henrich, Wapakoneta Tel. Co., Wapakoneta, O.; B. H. Hendrickson, Medina Tel. Co., Medina, O.; H. Henry, Warren & Niles Tel. Co., Warren, O.; C. C. Heller, Beaver Dam Tel. Co., Beaver Dam, O.; B. D. Herron, Mt. Vernon Tel. Co., Mt. Vernon, O.; E. K. Hertford, Charleston Home Tel. Co., Charleston, O.; M. M. Herron, M. W. & O. Tel. Co., Millersburg, O.; Gustav Hirsh, Ideal Con. Co., Hopkinsville, Ky.; Henry Hildebrandt, Washington Home Tel. Co., Washington, C. H. O.; Zelotes Howard, Cols. Citizens Tel. Co., Columbus, O.; H. L. Hine, Portage Tel. Co., Ravenna, O.; Wm. Hoyle, Cambridge Tel. Co., Cambridge, O.; J. L. Hoffman, Citz. Ind. Tel. Co., New Lexington, O.; A. F. Holmes, Athens Co. Home Tel. Co., Athens, O.; H. H. Hopkins, U. S. Telephone Co., Columbus, O.; C. W. Hogue, Toledo Home Tel. Co., Toledo, O.; F. K. Hogue, Telephone Mutual Ins. Co., Toledo, O.; Jas. B. Hoge, U. S. Telephone Co., Cleveland, O.; Chas. E. Hollander, Newark Tel. Co., Newark, O.; E. Humphrey, Home Tel. Co., Omega, O.; Eugene H. Hughes, Hamilton Home Tel. Co., Hamilton, O.; Frank N. Hughes, Hamilton Home Tel. Co., Hamilton, O.; Washington Hyde, Warren & Niles Tel. Co., Warren, O.; E. N. Hyde, Jefferson & Warren, Orangeville, O.; J. C. F. Hull, Bucyrus Tel. Co., Bucyrus, O.

Krice Ish, Plain City Tel. Co., Plain City, O.

F. N. Johnson, United Telephone Co., Bellefontaine, O.; W. Giv Jones, Prospect Tel. Co., Prospect, O.; G. Joseph, Citizens Tel. Co., Circleville, O.; Geo. W. Jones, So. Charleston Home Co., S. Charleston, O.; R. N. Judy, St. Marys Tel. Co., St. Marys, O.; G. R. Johnson, Columbus Citz. Tel. Co., Columbus, O.; C. D. Juvenal, Springfield Xenia Tel. Co., Springfield, O.; C. L. Jones, Athens Co. Home Tel. Co., Athens, O.

A. V. Kennedy, Milford Center Tel. Ex., Milford Center, O.; J. N. Keyser, Urbana Tel. Co., Urbana, O.; J. G. Kingsbury, Citizens Tel. Co., Delaware, O.; Frank A. Knapp, Local

Tel. Co., Bellevue, O.; S. C. Kissner, Citizens Tel. Co., Coshocton, O.; E. E. Knox, Portsmouth Tel. Co., Portsmouth, O.; E. D. Kramer, U. S. Tel. Co., Cleveland, O.; A. B. Kratz, Gallipolis Tel. Co., Gallipolis, O.; Geo. W. Kohn, Van Wert, O.; C. L. Lane, Telephone Insurance Co., Bellefontaine, O.; W. F. Laubach, Akron People's Tel. Co., Akron, O.; C. F. Lane, Citizens Tel. Co., Berea, O.; J. D. McLaughlin, United Tel. Co., Bellefontaine, O.; A. D. Leonard, Clyde Tel. Co., Clyde, O.; J. L. B. Leatherman, United Tel. Co., Herod, O.; W. E. Loveybridge, Mansfield Tel. Co., Mansfield, O.; H. A. Lanman, Columbus Citiz. Tel. Co., Columbus, O.; O. P. Lenox, Richwood Tel. Co., Richwood, O.; Cal. Liggett, Home Telephone Co., Plain City, O.; N. E. Liggett, Union Co. Tel. Co., Marysville, O.; L. W. Long, Citizens Tel. Co., Circleville, O.; J. E. Langstaff, Richwood Tel. Co., Richwood, O.; O. W. Loofbourer, Mt. Sterling Tel. Co., Mt. Sterling, O.; Carl Lutz, Citizens Tel. Co., Circleville, O.; M. Gochbilles, Sylvania Home Tel. Co., Sylvania, O.

Harry McDaniel, Ft. Recovery Tel. Co., Ft. Recovery, O.; C. Y. McVey, U. S. Telephone Co., Cleveland, O.; H. B. Mauck, Ohio Valley Tel. Co., Proctorville, O.; C. E. Marshall, Franklin Co. Tel. Co., Worthington, O.; W. J. Meech, London Home Tel. Co., London, O.; E. G. Miller, Warren & Niles Tel. Co., Warren, O.; Geo. H. Metheny, Lima Tel. & Tele. Co., Lima, O.; M. R. Meritt, Citiz. Tel. Co., Point Rock, O.; C. H. Marvin, Urbana Tel. Co., Urbana, O.; W. E. Moler, Athens Home Tel. Co., Athens, O.; H. P. Morrow, Hillsboro Telephone Co., Hillsboro, O.; W. C. Murnan, Burton Tel. Co., Burton, O.; J. Edwin Myers, Chicago Tel. Sup. Co., Elkhart, Ind.

J. B. Neubarger, Washington Home Tel. Co., Washington, O.; E. E. Newman, Edon Tel. Co., Bryan, O.; S. R. Newberry, Ashtabula Tel. Co., Ashtabula, O.; Fred Nicholas, Citizens Tel. Co., Circleville, O.; Chas. L. Norton, United States Tel. Co., Cleveland, O.

D. M. Odaffer, Marion Co. Tel. Co., Marion, O.; M. B. Overly, Central Home Tel. Co., Louisville, Ky.; Roy Owens, Citizens Tel. Co., Columbus, O.; D. O'Dell, Springfield Xenia Tel. Co., Springfield, O.

W. H. Pence, West Jefferson Tel. Co., W. Jefferson, O.; A. W. Paffenbarger, McArthur Tel. Co., McArthur, O.; L. G. Parker, Central Home Tel. Co., Louisville, Ky.; J. E. Flora, Camden, O.; B. W. Pickering, Union Tel. Co., Glouster, O.; W. H. Penrose, People's Tel. Co., Pennsville, O.; W. E. Peters, Athens Co. Home Tel. Co., Athens, O.; Walter M. Pyle, Citizens Tel. Co., Columbus, O.; A. R. Pollock, Piqua Home Tel. Co., Piqua, O.; A. J. Pounds, Citizens Tel. Co., Delaware, O.; J. R. Preble, Black River Tel. Co., Lorain, O.; J. W. Preble, National Tel. Co., Steubenville, O.; H. W. Putnam, Urbana Tel. Co., Urbana, O.

Jas. F. Rankin, Home Telephone Co., S. Charleston, O.; J. W. Ranson, New Citizens Tel. Co., Batavia, O.; Ralph Reamer, Ohio Ind. Tel. Ass'n., Columbus, O.; E. E. Reber, Cols. Citizens Tel. Co., Columbus, O.; J. C. Reber, Home Tel. Co., Dayton, O.; W. J. Reisinger, Franklin Co. Tel. Co., Canal Winchester, O.; Walter B. Riche, Lima, O.; N. W. Rinehart, United Home Tel. Co., Brooksville, O.; G. W. Rose, Union Telephone Co., Brooksville, O.; J. B. Rhodes, Zanesville Tel. & Tele., Zanesville, O.; W. G. Rhodes, Mowrystown, Mowrystown, O.; C. C. Rhodes, Citizens Tel. & Mess. Co., Fostoria, O.; Clarence E. Runey, Cincinnati, O.; J. F. Rosenbery, Federal Telephone Co., Cleveland, O.; H. C. Rogers, Mechanicsburg Tel. Co., Mechanicsburg, O.

Dwight E. Sapp, Mt. Vernon, O.; M. C. Sammons, Massillon Tel. Co., Massillon, O.; Chas. F. Saenger, U. S. Tel. Co., Cleveland, O.; E. R. Sharp, Cols. Citiz. Tel. Co., Columbus, O.; E. O. Sickles, United Telephone Co., Bellevue, O.; Geo. M. Scott, Riverside Tel. Co., McConnellsville, O.; G. A. Schleyer, Citiz. Tel. Co., Circleville, O.; Howard Swartz, Star Tel. Co., Cleveland, O.; J. Fred Sculyer, Citizens Tel. Co., Circleville, O.; A. E. Schwartz, Richwood Tel. Co., Richwood, O.; F. Schumecker, Minster Home Tel. Co., Minster, O.; R. H. Schugan, Mt. Sterling Tel. Co., Mt. Sterling, O.; G. W. Seaman, Fremont Home Tel. Co., Fremont, O.; J. G. Sheppard, Cols. Citiz. Tel. Co., Columbus, O.; Benj. Shearer, Independent Tel. Co., Bucyrus, O.; J. J. Shipley, Cuyahoga Tel. Co., Cleveland, O.; Fred G. Six, Sound Waves Pub. Co., Chicago, Ill.; L. E. Sims, Covington Home Tel. Co., Covington, O.; J. W. Seckler, Yorkshire Tel. Co., Yorkshire, O.; Edward E. Smith, Circleville, O.; I. J. Smith, Citiz. Ind. Tel. Co., New Lexington, O.; H. H. Smith, Prospect Tel. Co., Prospect, O.; J. F. Smith, Harrison Co., Tel. Co., Cadiz, O.; F. S. Spurrier, Elliott Tel. Co., Elliott, O.; J. E. Spiers, Lucas Tel. Co., Thornville, O.; J. E. Steinkamp, New Ottawa Co. Tel. Co., Elmore, O.; G. M. Stevenson, United Telephone Co., Bellefontaine, O.

H. W. Stoker, McComb Home Tel. Co., McComb, O.; James Stoops, Valley Tel. Co., Waynesville, O.; A. H. Stiencker, New Knoxville Tel. Co., New Knoxville, O.; Harry Sotzer, Shelby Local Tel. Co., Shelby, O.; Dillwyn Stratton, Winona Central Tel. Co., Winona, O.; Wm. Swinger, United Home Tel. Co., Trotwood, O.; A. W. Surrell, U. S. Tel. Co., Columbus, O.; M. Sullivan, Upper Sandusky Tel. Co., U. Sandusky, O.; L. M. Studevant, Sidney Tel. Co., Sidney, O.

Howard Taylor, Eastern Ohio Tel. Co., E. Rochester, O.; Morris Taylor, Eastern Ohio Tel. Co., E. Rochester, O.; I. H. Thedieck, Sidney Tel. Co., Sidney, O.; W. Gilbert Thompson, Hamilton Home Tel. Co., Hamilton, O.; G. P. Thorpe, Clinton Tel. Co., Wilmington, O.

A. J. Unger, Bucyrus Tel. Co., Bucyrus, O.

G. W. Venner, Findley Home Tel. Co., Findley, O.

M. D. Ward, Mansfield Tel. Co., Mansfield, O.; S. E. Ward, Mansfield Tel. Co., Mansfield, O.; O. O. Welsheimer, U. S. Tel. Co., Columbus, O.; L. E. Willis, North Lewisburg Tel. Co., Lewisburg, O.; G. H. Welch, Citiz. Tel. Co., Columbus, O.; F. E. Wesley, Citiz. Tel. Co., Columbus, O.; A. A. Whitney, Morrow Co. Tel. Co., Mt. Gilead, O.; G. W. Wing, Franklin Tel. Co., Dublin, O.; Chas. Wilson, Home Tel. Co., Plain City, O.; Thos. F. Wilson, Citiz. Ind. Tel. Co., N. Lexington, O.; R. T. Wolfram, Local Tel. Co., Bellevue, O.; R. O. Wooster, Caldwell Marietta Co., Warner, O.; W. B. Woodbury, Home Tel. Co., Detroit, Mich.; A. J. Wright, Wood Co., Tel. Co., Bellevue, O.; D. A. Yoder, Toledo, O.

Brig. S. Young, Beaumont Tel. Co., Beaumont, Tex.; N. Yenrick, Lancaster Tel. Co., Lancaster, O.; C. D. Young, Citizens Tel. Co., Delaware, O.; C. E. Yoder, United Tel. Co., Bellefontaine, O.

J. Zeack, Mt. Sterling Tel. Co., Mt. Sterling, O.; C. E. Zahn, Clinton Phone Co., Wilmington, O.

### A New "Everbest" Salesman.

George H. Peirce who accepted a position with the Ewing-Merkle Electric Co., St. Louis, as manager of their growing telephone department succeeding Mr. LeBourveau got his early training under C. E. Stinson and C. O. Harris at Rochester, New York, with the Bell. This was before the time of the Independent movement. He left the Bell Company some eight years ago to take a position as salesman for the Stromberg-Carlson Telephone Manufacturing Company, which was his first work in the Independent field. Since then he has held a number of positions of trust and importance but was attracted to the Ewing-Merkle Electric Company by the sterling integrity of their business dealings and the excellence of their line of apparatus.

### Cook's No. 8 for Quincy.

Frank B. Cook has received from the Dean Electric Co., the order for the complete switch-board protection for the new exchange at Quincy, Ill., and they have specified that Cook's No. 8 self-soldering protector shall be used. The distributing frame has a capacity of 4,160 pairs, and is to be equipped with 3,200 pairs of the No. 8 protectors. McMeen & Miller are the engineers who are in charge of the construction.

The Swedish-American Telephone Company was among the leading exhibitors at the Iowa State Telephone convention which opened at Des Moines, Tuesday, the 13th. The above company was located in room 528 with a complete display of their well known product. Their exhibit was in charge of Chas. H. Macklin, F. M. Ferguson and W. O. Rhode. Judging from the constant crowd of visitors it is safe to assume that the Swedish-American Company secured their share of the business.

## How the Manufacturer Should Reach the Telephone Purchaser

There have been many ways suggested for the telephone exchange man to reach his subscribers, but there has been practically nothing told of the ways and means of reaching the purchasers of the telephone. Of course such a discussion might not be of much interest to the owner of an exchange, but there may be something which will give him pointers on how the best manufacturers go at it to get business. There is a considerable similarity in the securing of all kinds of business.

One of the first requisites of a successful business is a good department of publicity. By such a term is meant, an advertising department. A telephone house that will not advertise will soon drop out of sight. Where shall a firm advertise? Where the buying public will see it, of course. This is an easy answer, but it does not tell where these papers are to be found. There are good telephone papers in the field that reach practically all of the telephone buyers and by having an advertisement in such papers there will be positive returns. Very frequently the returns from the technical paper are not directly apparent, but the result is that everybody knows of the apparatus made and when in the market, the reader of the paper will send in an inquiry without stating the source of the knowledge he has of the existence of the company.

Telephone makers are provided with clippings each day which give information of the new companies formed and by using this knowledge considerable information is gained.

It is the intention of this article to state how a customer is landed after it is discovered that he is in the market.

Every successful telephone manufacturing company should have a very efficient corresponding force and should have a good traveling salesman on the road in each good sales district. The salesman should have a good working knowledge of the telephone so that minor troubles may be remedied, and if he can take care of the major difficulties for the customer, all the better. The salesman quite frequently can secure a good customer by helping him out of a bad case of trouble.

The salesman must be a good judge of human nature of course. He must be a man of almost infinite patience. The selling of telephone apparatus is different from almost all other sales because ninety-nine out of every hundred purchasers do not know what they are buying. It is comparatively easy to pull the wool over the eyes of the customers by showing the talking points of the instrument. Even though the telephone is wholly bad, there may be a large number of so-called talking points about it which will convince the prospective customer. Selling a telephone that is inferior may work once or twice, but it will not be long before the apparatus will show up for what it is worth.

The good salesman will make friends with the purchaser and will tell him truthfully about his goods and will make a reputation for square dealing. He is able to get around among the customers and will show them the new things that are coming out. By being around the territory, the salesman hears of most of the new deals

that are to be made and he can count upon all of his customers saying a good word for him.

In the office the inquiries are coming in all the time and these need immediate attention. One of the main secrets of a successful business is attending to business inquiries promptly. A man usually does not make inquiries till he is about ready to buy, then he wants the information mighty quick. It is very aggravating to receive a reply to a quotation saying that the purchaser could not wait for the quotations and ordered elsewhere. It is not unusual to get a letter of inquiry asking for a reply so that the prices may be received at a certain time which is past when the letter is received. If a good inquiry, do not be afraid to use the telephone or the telegraph in order to get in your quotations. The prospect loves a man that will go out of the way to accommodate. When an inquiry comes it should be ascertained just where the location may be so that the roadman may take care of it if he is in that locality; if it is sufficiently important the man should be sent after it immediately, and if it is not possible to have a personal representative on the spot, the prices should be given from the home office. The salesman should always be notified of quotations made in his territory and a record should be kept of the good inquiries so that the salesman may be notified regarding them when in the part of his territory from whence the inquiry came.

The salesman's route is often governed by the local conditions in his territory. It is not always possible to lay out a fixed route, for there are new openings all along the way that are first class prospects. Such openings are frequently known only to this salesman and he has the best of chances to make a sale before his rivals arrive on the spot.

With all the vigilance possible, some of the inquiries can not be reached by the salesman, and these must be negotiated by the office. It is particularly difficult to get at the customer properly from the office. One must be careful not to talk one man to death, and to another, the letter cannot be too long. In most cases, a long letter should be written, because most of those who are about to buy, are not acquainted with the goods and they do not seem to appreciate printed matter. Many of the telephones are being bought by farmers and as they do not know much about the subject, they are very grateful for a long letter telling them all about the good points of the apparatus. The telephone buyer is sufficiently familiar with the list and net prices on apparatus to be suspicious of the first prices quoted. Care must be taken to point out in the letter in detail just what the prices mean.

There are some customers who can not understand what two per cent. discount for cash with order means. To these the net price for cash and the net price on time should be carefully figured out. After you have carefully explained the prices to a prospective customer, it is not unusual to have him come back and tell you that he received your letter but that he would now like to have your prices as he originally asked. It may make you feel like fighting somebody but do not lose your patience. He is probably trying to ascertain whether you are in the habit of quoting two or more prices. He does not know that



you have an accurate record of the quotations. Write him a polite letter and repeat your quotations, take a little more pains with him and the chances are that he will be brought around.

Never, under any circumstances show impatience even in the slightest degree. It is easier to show temper in a letter than any other way. The print cannot show the inflection in your conversation. It is cold and may give an entirely false idea of what is intended. Be very courteous to all no matter if there is no prospect of a sale. A reputation for courteous treatment makes many future sales. When a sale is lost, write to the man and tell him that you are sorry that you did not succeed and wish him success. Thank him for his courteous treatment of yourself or your company and show him that you are a good loser as well as a good winner.

After answering an inquiry, do not let it stand until you hear from it again. In a reasonable time, if a reply has not been received, write again, write even a third and a fourth time. Give a good argument each time you write. Send stamped and self addressed envelope for convenience so as to put him to no expense. If the man has made the first inquiry, it is nothing more than fair that he should show you the courtesy of a reply. You need not tell him that however for he would get out of patience immediately.

When a person makes an inquiry as to prices, it is proof that he is interested and there can be no imposition on the part of the salesman if he turns every stone to make the sale.

Do not judge a man by the clothes which he wears. When a millionaire wears poor clothes it is considered an eccentricity. It is only the unmonied man who can not afford to wear shabby apparel.

When you make a sale guarantee the goods fully and do not hesitate to make good any imperfection in the apparatus without expense to the customer. One of the principal reasons of the success of Marshall Field lay in fair dealing. Anything which he sold was right or he wanted it brought back.

Good apparatus is a constant advertisement while poor instruments are a continual detriment. A poor telephone is known by all people within a wide radius and will prevent many sales. When a telephone once secures a good reputation in any locality, it is almost impossible to displace it.

#### Indiana Telephone Men at Fort Wayne.

Independent telephone men from all the counties of northeastern Indiana, representing the second district of the State Independent Telephone Association, met in the Commercial Club rooms at Fort Wayne, April 5, and discussed matters of much interest. Papers were read by J. F. Roof on "Danger of Free Service Between Stations;" M. B. Larmer on "Protective Devices" and Frank A. Staub on "Storage Batteries." The most important action was the passage of a resolution against the further maintenance or connection of companies not included in the Independent association. It means that the Independents will sever interchange of business with the Bell company and its auxiliaries, and will be presented to the state association for ratification. W. S. Vivian, of Grand Rapids, manager of the Michigan Independent Telephone Traffic Association, was present, and delivered an address on the "Workings of the Michigan Clearing House." Those represented at the meeting were:

F. M. Schirmeyer, Citizens' Telephone Company, Decatur; H. L. Buuck, Preble Telephone company, Preble; W. L. Moelling and George T. Fox, Home Telephone Company, Fort Wayne; E. M. Popp, National Telephone Company, Fort Wayne; John and Frank Emerick, Farmers' Mutual Telephone Company, Hometown; E. M. Wasmuth and E. E. Richards, Roanoke Telephone Company, Roanoke; W. O. Taylor, LaGro-Andrews Telephone Company, LaGro; J. F. Roop, Northern Indiana and Southern Michigan Telephone Company, Sturgis; A. B. Emerick and A. Scherer, Poe Rural Telephone Company, Poe; Harry Ihrie, Mr. McCulloch, Garrett Telephone Company, Garrett; L. Taylor, Steuben County Electric Telephone Company, Angola; V. A. Geiger, Geiger Telephone Company, Churubusco; G. E. Spake, Monroeville Home Telephone Company, Monroeville; A. A. Adams, Columbia City and Whitley County Telephone Company, Columbia City; Harry Inks, Ligonier Telephone Company, Ligonier; H. E. Crow, Elkhart Home Telephone Company, Elkhart; W. S. Vivian, manager Traffic association of the Michigan State Telephone Association, Grand Rapids; J. R. McDonald, Auburn; J. S. Stewart, Sturgis; E. J. Fisher, Kendallville; W. E. Bowers, M. B. Larimer, Fort Wayne; Frank X. Staub, Fort Wayne; Thos. Bromley, Jr., Muncie; E. H. Shafer, Indianapolis.

Mr. E. W. Dunaway, until recently general manager for the Texas Consolidated Long Distance Telephone Co., is now associated with the North Electric Co., of Dallas, Texas. Mr. Dunaway has been in Texas for about three years, during all of which time he has been identified with the Independent telephone interests, having served as manager for the Citizens' Telephone Co., at Paris,



E. W. DUNAWAY.

Texas, which company, under his management of about two years' duration, increased its subscription list something over 300 per cent. He is recognized as the most prominent man connected with Independent interests in that state, having been president of the state association. The North Electric Company, it is needless to say, is still prospering and ever ready to do anything to promote the Independent telephone business, either in Texas or elsewhere.

The Ridgefield and Vancouver Farmers' Union Telephone Company of Vancouver, Washington, has been organized to build a line from Ridgefield through intervening villages to Vancouver. J. M. Hoff, president; A. J. Stover, vice president; Howard Bellinger, secretary; George Page, treasurer.

## JUST A MOMENT!

Q. Do you realize what the use of good batteries means to your telephone system—even if you don't count the money they save?

Q. Good instruments, proper wiring, and **good batteries** make **good service**—good service means **satisfied users** and this means **more subscribers**.

Q. Think it over. You'll lose ground if you use cheap batteries. **Quality counts.**



**THE NUNGESSER ELECTRIC BATTERY CO.**

CLEVELAND, O., U. S. A.

GENERAL SALES OFFICE  
No. 128 WEST JACKSON BLVD.  
CHICAGO

## What Are Your Intentions?

Q. Are you figuring on improving the service of your telephone system or are you going to go on in the same old way, with the same old annoyances, troubles and kicks bound to recur.

Q. Instead of a faulty and poor service line why not anticipate the complaints which are sure to come, and equip your line with

### Andrae Condensers

Q. By their use such things as "listening in" and the breaking of the circuit by leaving receivers off their holders, are made impossible.

Q. We have a standing offer to *equip an entire line on trial* and will pay *return charges* if you say they're not as represented.

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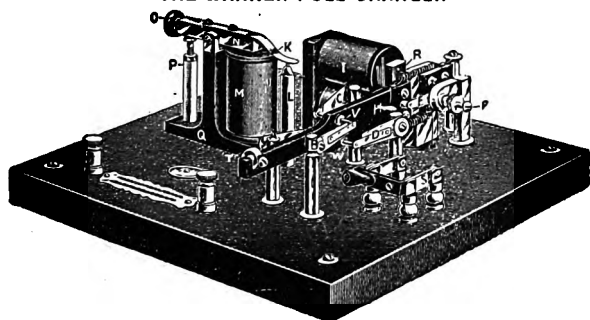
Our large catalogue, No. 11, will be sent upon request. It's *free* for a postal. Write for it *to-day*.

**JULIUS ANDRAE & SONS CO.**

220 W. Water St.

MILWAUKEE, WIS.

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Patented Nov. 5, 1901. Other patents pending.

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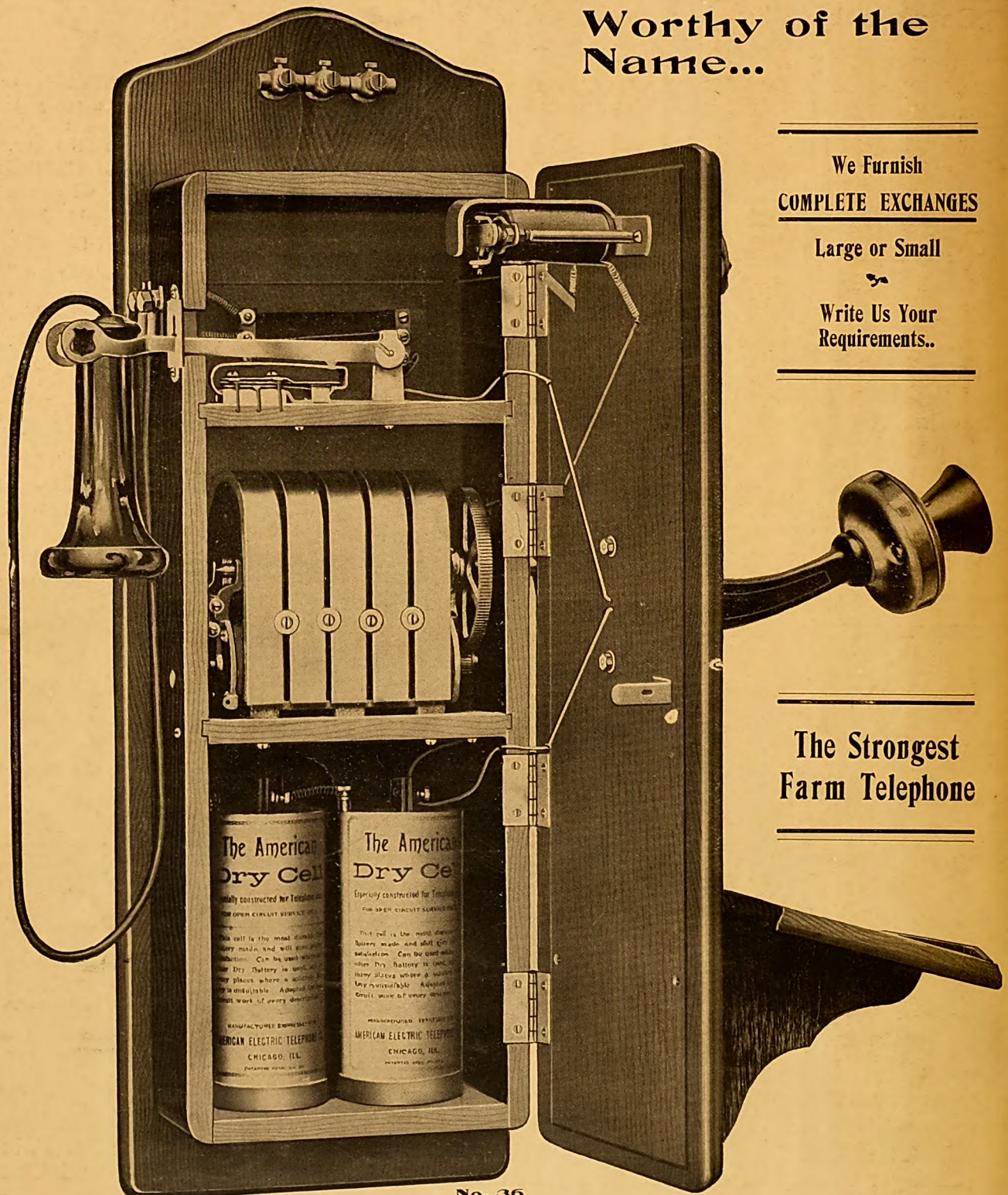
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Write Us Your  
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No. 36

**American Electric Telephone Company**  
State and 64th Streets, CHICAGO



# SOUND WAVES

VOL. XII  
No. 1

AN ADVOCATE OF  
INDEPENDENT TELEPHONY

JUNE  
1906

Published Monthly by THE THOMAS H. WILSON CO., Logansport, Indiana

## STANDARD Underground Cable Co.

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Philadelphia  
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New York  
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Oakland, Calif.,  
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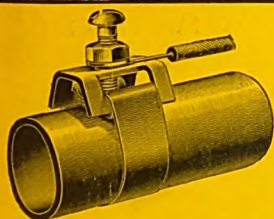
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It may be Applied with a Brush to Cypress Poles, Giving them the Life of Cedar

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**JONESBORO, IND.**

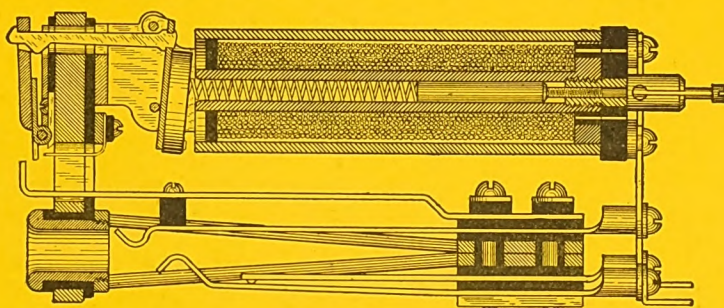
**QUALITY AND PRICE DECIDE**



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THE varying conditions of bridging lines make it necessary to have an adjustment on bridging drops if it is desired that a distinct signal be given the operator. On a short light line a drop receives a large amount of current and without some adjustment feature the armature will pull up and stick without giving a distinct buzz. The operator is then unable to determine whether the call is for central or for another subscriber on the same line unless she plugs in. In all MONARCH bridging drops a



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## Monarch Telephone Mfg. Co.

CHICAGO, U.S.A.



# SOUND WAVES

A Monthly Magazine Devoted to the Interests of Independent Telephony

Vol. XII.

JUNE, 1906

No. 1

## SOUND WAVES

PUBLISHED MONTHLY AT LOGANSFORT, IND., U. S. A. PRICE FIFTY CENTS A YEAR

Entered as second-class matter July 14, 1903, at the Post Office at Logansport, Indiana, under Act of Congress of March 3, 1879.

The Thos. H. Wilson Co., Logansport, Indiana, Proprietors and Publishers

W. A. TAYLOR, Technical Editor, . . . . . 860 Monadnock Bldg., Chicago  
F. M. BAILEY, Manager, . . . . . 860 Monadnock Bldg., Chicago  
FRED. G. SIX, Editor, . . . . . Logansport, Ind.

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## NOTICE TO ADVERTISERS

Changes of Copy must be in this office not later than the 1st of each month. We can not insure changes of copy being made or advertisements being withdrawn after that date, as advertising forms begin going to press the 1st.

New Advertisements can be inserted if received by the 5th of each month, but to insure proper classification they should be in this office by the 1st.

To mail the paper promptly, it is necessary for us to adhere strictly to the above, and we will appreciate the co-operation of advertisers.

Subscriptions, Etc.—Address the Logansport Office. In sending personal checks for books or subscriptions, include 15 cents for exchange.

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## EDITORIAL COMMENT

All communications to the advertising department of this paper should be sent to the Chicago office, addressed plainly to SOUND WAVES, 860 Monadnock Bldg., Chicago, Ill. All communications to editorial department, answers to want advertisements, subscriptions, etc., address SOUND WAVES, Logansport, Ind. Subscribers and others will confer a favor and facilitate the work of this paper by complying with the above request. Technical and news contributions will receive prompt attention and are respectfully solicited.

## THE BELL'S "IDEAL AGREEMENTS"

Not very many years ago the Bell Telephone Company had entire control of the whole field. It had well supported exchanges and its toll line business was growing at a rate that guaranteed the company untold wealth in the years to come. The people have not forgotten the exorbitant prices charged for business and residence 'phones, and the company's invariable refusal of frequent requests and petitions to reduce rates and give those in moderate circumstances an opportunity to enjoy the use of this modern convenience. It is claimed now that a reduction of twenty-five per cent. on the rates of 'phones, a few years ago would have increased the Bell Company's interests one hundred per cent or more and would have removed, to a great extent, the main incentive for the organization of the Independent companies.

To the advice of whatever officers of the Bell Company causing the refusal of each request of this kind, the Independent telephone men, probably, owe a vote of thanks. The Bell Company is dying hard, but there is not an Independent telephone worker in the field that has any sympathy for the big corporation.

Failing first to drive the Independent companies out of business by threats and law suits, and later buying local rivals, they now have gotten to a point where agents are sent into the cities where telephone contests are being waged and personal letters are being written to each subscriber of the Independent companies. In Indiana where so many Independents are thriving, the Bell is particularly anxious to stay in the field. It recently bought outright the United Telephone Company which controlled the Independent exchanges at Marion, Bluffton and Hartford City, immediately cutting the wires into the Central Union exchange. This was met by prompt action on the part of Independent owners, who refused to have any connection with the United Telephone Company since its change in ownership.

Upon the consummation of the deal the Bell immediately began to dictate to the Home company at Wabash and wanted to make connection by means of one of their "ideal agreements," but the Home company as promptly refused all offers, preferring to stick to its

agreement with the Independent Association which now gives the company 200,000 connections as against 40,000 left for the Bell to give. Now the Bell has mailed a letter to every subscriber of the Home Company, the same being characteristic of former tactics of the big corporation and which the Independents claim is false and impudent. The letter which follows is said to have been sent out by the district superintendent of the Bell at South Bend, Indiana:

"As a citizen of Wabash you cannot help but be interested in an article which appeared in your paper, Plain Dealer under date of March 20th, stating that the Home Telephone Company at Wabash had declined a proposition to co-operate with us in giving the city of Wabash an ideal telephone system, similar to that which is enjoyed by your neighboring towns, an arrangement whereby the people of Wabash may have connection with any telephone in the country, and, at the same time, be relieved of the annoyance, inconvenience and expensive burden of two telephones. Our subscribers are desirous of having connection with the people of Wabash and we are now arranging the preliminary plans covering a new central office in your city which will furnish first-class local and long distance service.

Before starting the work of installing a duplicate plant, however, we wish to call your attention to the fact that the Central Union Telephone Company stands ready and willing to enter into an ideal operating agreement with the Home Telephone Company at Wabash similar to the one which was recently made at Marion, Bluffton, Hartford City, etc., whereby the citizens of Wabash can secure connections with any telephone in the country and have but one telephone system.

We respectfully ask you to consider this point as to its value to the citizens of Wabash and believe that you must ultimately realize that such an arrangement would prove ideal in that it would obviate the burden, expense, inconvenience and annoyance of two systems, and we would further impress upon you the fact that if the citizens of Wabash are to be burdened with two telephone systems, that it will not be because of unwillingness on our part to get together with the Home Company but rather on account of the attitude assumed by your Home Company.

"We believe that if the present Home Company is only 'Independent' and not antagonistic in so far as the welfare of Wabash is concerned, that a mutual operating arrangement can be brought about which will eliminate the various objections resulting from the installation of a dual system and thereby give to the citizens of Wabash an ideal telephone system.

"The above is respectfully submitted as a matter in which you as a citizen of Wabash must have some personal interest and we hope we may in future, be able to serve you through such an arrangement as is herein indicated."

To counteract what little effect this might have the Wabash Plain Dealer makes the following reply:

"Nearly fifteen years after the period when the Bell had control of this field, and there is but one exchange and toll line system in Wabash, comes the tearful appeal to the people to throw down the Home Company by forcing it to break faith with its Independent connections and thrust its head into the jaws of the Bell lion. The time for the Central Union to act was in 1894-5 when it might have prevented the organization of the new company by decent treatment of the public.

"Again there is the threat, often repeated, and ninety-nine per cent, cheap bluff, that unless you compel the Home Company to ruin its business by rupture of its agreement with the Independents that afford it toll connections, a new exchange will be built and the Home will be forced to the wall by the Bell monopoly.

"The proposition to enter into an 'ideal operating agreement like that at Hartford City, Marion and Bluffton' implies the absorption of the Home by the Bell since the United Company served those points independently until the 'ideal agreement' was effected through the sale of the Bell. In other words Wabash people have have an 'ideal agreement' by forcing the Home Company to sell out to the Central Union. Do the patrons of the Home Company want the 'agreement' at the price?

"The Central Union Company refuses to interchange traffic with the Independents wherever it has the upper hand. No Independent company can make any contract whereby the Chicago Telephone Company, Bell, will handle a single Independent message in that city, it having a monopoly, but where, as in the case of Wabash, the Bell is whipped out, it begs abjectly for Independent connections and 'ideal agreements,' not only to restore its fallen fortunes, but to cause dissension among the Independents, disrupt the association by which only a successful fight can be made against the Bell, and when the Independent toll lines have gone to smash, the Bell may step in, pick up the business established at enormous expense, and which is thus wantonly thrown away.

The public is familiar with the tricks of the Bell, and the whining plea that all it seeks here is an 'ideal agreement' is so silly, so hypocritical that it inspires in every man acquainted with the situation only ineffable disgust."

### The Increase of Telephone Rates

The trite subject of the increase of rates must of necessity creep in on all telephone matters at various times. In a recent issue we tried to show why the cost of service in very large exchanges did not increase so very fast as to warrant excessive rates. While it is true that the rates should not increase rapidly after the system is composed of a number of branches more or less nearly equal in size, it is a fact that the expenses increase very rapidly for the system which has but one central exchange or one which has but a few small branches. Those who have not followed the expense accounts of a rapidly increasing exchange cannot possibly conceive of the immense amount of expenditure necessary each year. When a system first starts, the subscribers are those who most need the service and as these are the business people, it follows that all the lines are short and the investment small. As the exchange grows the lines become longer and longer till finally the last lines are those which are several times longer than the first ones installed. When the system grows it becomes necessary to increase the extent of the underground service and this means a greatly increased investment. A multiple switch board of two thousand lines has about sixteen thousand multiple jacks with the necessary cables attached. A board of four thousand lines has about sixty thousand multiple jacks. So far as the jacks are concerned, the expense increases as the square of the size. Why then did those who built the exchange agree to give service at a ruinous rate? Partly because of ignorance of the business but

mostly because they did not have any conception of the extent to which the business would grow. The only data regarding the number of subscribers possible came from counting the Bell company's list. As the Independent company charged less they figured in some cases on twice the list but in most cases on about fifty per cent. more. What was the result?

In most cases fully four times the number of lines were obtained. In many cases the Independent company has eight times as many lines as the Bell company had when competition was started. In the face of such facts, does it not seem fair to grant the increase in the rates. Of course it is true that the company should look out for a rate increase provision when asking for a franchise, but in most cases the oversight is excusable as it was thought that the number of lines would never increase beyond the danger limit. It is also fair and reasonable to expect that the city authorities will not frown upon the increase where it can be shown that it is necessary. It is usually the signal for some vampire newspaper to begin an attack upon the company when it is necessary to increase the rates. The same papers will with brazen face double the price of the paper in the face of news expenses incident to a war, but it will always be noticed that they are the last to cut the prices after the war is over.

There is an invertebrate sheet published in Cleveland now which is trying to pose as a financial authority. But if it is examined, it will be found to be filled with congratulatory articles regarding the Bell companies and gross falsifications regarding the Independents. Of course it is well understood that it has been sold for a "mess of pottage" but it would certainly seem that a person with any manhood would refuse to sail under such a pirate flag. By all means if one thinks it let him express an opinion but do not pose for one thing and be another. There are a few advertisements in this paper, but in reading those of the Independent telephone companies, one wonders whether they do so for the same reason that some people recently advertised in a certain New York publication. They had better get out soon or they may have to buy a book also.

### "Don't It Beat —!"

That some Independents will persist in furnishing ammunition to the enemy by continuing to purchase apparatus from the Kellogg Company (owned by Bell officials).

Loyalty, consistency and horse-sense do not appear to be in evidence in the make-up of some Independents.

It is well that the armies of Washington and Grant were not composed of as many traitors to the cause of freedom as are in the Independents' ranks.

How can an Independent consistently solicit a subscriber to his service in preference to the Bell and then take this subscriber's money that he pays for rental and send it to the Bell Company for apparatus?

Is it horse-sense to pay a profit to the Bell Company thus giving them a record of your growth; so that they may take this profit and spend it in your own territory to fight you with; thus making you, virtually, furnish the funds to bring about your own downfall?

(The same methods used to hoodwink and rob the public for years, and of which you are so well posted, is

being practiced on the purchasers of Kellogg apparatus.) Was there ever before such a ridiculous farce carried out, and in such an audacious manner, or perpetrated on any class of people, as the Bell Company is now doing to the poor misguided customer of an ear-marked Bell supply company?

The Bell Company has repeatedly represented to capitalists that the Independents were novices in the telephone business as well as in commercial methods, and to prove it they proposed to show capitalists that they could make the Independents actually furnish the funds to carry on their (Bell) fight against them (Independents), and, insane as it may appear, are actually doing this very thing to a great many Independents via this route. There are a number of Independent telephone manufacturers who make better equipment than does this company and will sell at just as low a price. Yet in the face of this, coupled with all other conditions, there are some Independents that will persist, in the face of providence, to purchase of the Bell.

And some Independent telephone publications will persist in accepting advertisements from the company that is against the principle which they advocate, and thus impose Bell advertising upon the class of people that make it possible for them to exist. There are Independent associations that elect officers that are tools of the Bell; and then they get up in conventions and read long winded papers, advising others to purchase Bell-tainted apparatus. The Bell Company certainly is to be complimented; they buy an Independent manufacturing plant, sell their product to Independent exchanges and use the profit to fight Independents. Their tools or customers are permitted to be members, attend and even be elected as officers from president down of some Independent associations. They are gradually inducing many Independents to become sub-licensees. When the pilots of Bell crafts see how easily they can run down the Independents without injury to themselves, but with profit, they no doubt view the sickly methods of some Independents with nauseating disgust. Even the Bell likes to see a real fight.

Independents buying Bell-tainted equipment should stop to think that it is bad business to have their money used to depreciate the value of their property so that eventually the Bell Company can buy it at what they have made it worth rather than what it was worth before they took your own money and used it against you. You demonstrate to capitalists and the general public that you have poor judgment, bad business ability, no foresight, no consistency and in fact, that you need a guardian when you purchase goods of those that you admit are trying to put you out of business.

The Independent telephone companies have at least half a million more subscribers than the Bell people. In Ohio they've over 200,000, while the Bell has less than 110,000; in Indiana they've 165,000, while the Bell has only 35,000. In the city of Los Angeles the Independents have nearly 25,000 against the Bell's 15,000. In Kansas City, Indianapolis, Louisville, Toledo, Rochester, and scores of other centers, the Independents have the other fellows licked, badly licked. In Toledo, for example, the Independents have 8,500 stations in operation, and the Bell less than three thousand. And the Independents have only now fairly begun to develop the big cities.—"Success" Magazine.



# Managerial Co-Operation

A most worthy article upon successful soliciting by Mr. F. B. Chester in your issue of February, 1906, will be found applicable in securing new business in many localities, but take an Independent exchange which is practically isolated from its neighbors, what will the answer to a prospective patron then be when asked regarding his company's long distance connections?

He must truthfully answer the question, pointing out any and all outside connections, the quality of the service, and also the saving that can be made per month when the rates are lower than that of his competitor, which is generally the case.

This long distance problem has become a bugbear to the companies operating in this locality, owing to the fact that the Independents have no connection with Chicago. Long distance service in connection with a residence and business telephone has become of equal importance to a bath in a patron's residence. What up-to-date man would build a modern residence and leave out the most essential part thereof—the lavatory? If a man never used a bath-room or a long distance telephone, he has the satisfaction of knowing he has either at hand should he so desire. This is human nature, and although arguments will be advanced to prove same a fallacy, yet exchange managers will agree with me, that although, revenue is the very source of existence, yet long distance lines are the very source of revenue.

An employe may be a most excellent solicitor and fail to secure business in paying quantities, owing to the public's lack of confidence in the company he represents. No company can expect solicitors to be successful if there is not earnest co-operation upon the part of the company.

Solicitation letters should be mailed to prospective patrons, followed within three or four days by a call from the solicitor. A card file system should be maintained in which the date, nature of letter and solicitor's calls are kept. Also upon this card there should be a space for solicitor's notes, and date of return call. Then write a strong follow-up-letter stating your strong points, avoiding the use of technical terms and other confusing phraseology. In this manner you can pave the way for your solicitor, and afford him a systematic list of prospects.

Newspapers used as a medium for advertising make your solicitor's work easier. Keep your company before the public at all times. Give special mention of all additions and extensions added to your system in the newspapers. They are glad to publish this news and it keeps your company constantly before the public eye. Reticence has ruined more Independent companies than strong competition, and providing they continue in the same old rut it will ruin many more. While I do not believe in stooping to subterfuge in securing new business, yet I do maintain that a solicitor or any other employe of a company should never expose the weak points of his business.

Employees can work an endless amount of harm where competition is close, or where your competitor has the upper hand, by gossiping. They should be trained to extoll the company by whom they are employed and the merits of its service at every opportu-

nity. By so doing every employe becomes a solicitor. Do not make an attempt to increase until you are prepared to do so. For while it is easier to convince a telephone user that you have superior telephone service to that which he is at present enjoying, yet temporary work made necessary upon the part of the installation department, owing to limited capacity, will often discourage your patron at the outset, and depend upon it he will give your company a black eye at every opportunity.

Give efficient service, train your operators to be courteous under all circumstances, as well as eliminate gossip, and render continuous assistance to your solicitor by the use of letters, cards, etc., in securing new business and you will reap your share of success.

In an exchange where your competitor has double your number of subscribers, it is as difficult to hold your old subscribers as it is to secure new ones, regardless of the superiority of service and cheaper rates. An earnest effort should be made to hold your present subscribers in line as well as increase your subscription. But where the real rub comes is in invading the residence portion of a city. Too little attention is given to the increase of residence telephones, and while I will admit there is not as much revenue to be derived from residence phones, as compared to business, yet you must create a demand for your service, and residence phones are absolutely essential, in reality, they are the main factors in supplying this demand.

The problem that many of us have been confronted with is invading a circle of friends. Mrs. Brown will not change her 'phone because she must retain telephonic relations with Mrs. Smith and others, or Mrs. Brown will not have an Independent telephone installed because Mrs. Smith has the old 'phone, etc., etc.

The solicitor has but one recourse left him in a case of this kind, and that is to get a list of Mrs. Brown's friends, call upon them individually, importuning them to arrange a date for installation of the new 'phone, which will be amicable to all.

The above requires great perseverance, persuasion and tact, yet it has been proven to be practicable by numerous up-to-date solicitors and managers. Contracts are another stumbling block and one which is insurmountable. I do not believe in accepting business when the applicant is a contract jumper. This weakens your hold upon your own subscribers, for if your competitor's contracts are worthless, yours also are. An over arduous solicitor will sometimes pursue this course but it is the duty of the management to point out its fallacy.

Contractants should always be respected. The only means of overcoming this feature of soliciting is this: Get the date of the proposed subscriber's contract, if possible, carefully check each issue of your competitor's directory. As directories are issued on an average of four times a year this check will give you an accurate list of new installation and within two months of the correct date of expiration of the contracts.

You should keep as thoroughly posted upon your competitor's increase or decrease as upon your own. About two months prior to the expiration of one of your competitor's contracts, place the prospective patron's name in the hands of your solicitor. In this man-

ner you save your solicitor's time for he will no longer be compelled to stumble blindly along looking for new patrons, but will have a systematic list of prospects for each day of the month.

Remember that managerial assistance is essential to

a solicitor's success. Co-operate with your solicitor, strengthen all weak points that he may call to your attention.

Give the public a careful hearing upon any and all demands, and last, but not least, institute a system at once.

H. H. BRATT.

## Independents Meet at Joliet

Representatives of fifteen Independent Telephone companies met at Joliet, Illinois, April 10th. These companies are in the first district and are among the strongest in fighting the cause of Independent Telephony in the state of Illinois. It was decided to further co-operate for the purpose of equalizing toll charges, bettering conditions, local and foreign, and are beginning upon even a more strenuous fight than heretofore against the Bell system. From the many expressions of condemnation over the actions of the managers of the Bell companies, it is believed that this association will work as a unit towards perfecting the service of its companies, and thereby help to lead the Independents to victory.

A. J. Vernier, president of the District Association, called the meeting to order, stating its objects and purposes and outlining the policies to be pursued during the next year with the consent of the delegates.

The Hon. C. B. Cheadle, secretary of the State Association, in an address to his audience, said that there can be no question as to the advantages of organization, and that every telephone man understood that organization is necessary. He made reference to the Independent lines all over the country and spoke enthusiastically on the future's bright prospects for the cause. He further stated that the Independent 'phones in the districts of Northern Illinois and the immediate districts of states adjacent, outnumber the Bell 'phones two to one, pointedly referring to the argument that an Independent system would not be a good thing for Chicago. He said a large amount of business is diverted from Chicago because of business men in smaller cities and towns, seeing fit to trade with houses in Peoria, St. Louis, Springfield and other places where there are home 'phones, and that Milwaukee will be next. Numerous faults of the Bell system were pointed out, notably its over charge in service, inequalization and unfairness in toll rates, and prevalence of party line systems. These evils, it was declared are destroyed to a great extent by the competition of the Independent companies.

Among the numerous other speakers at this meeting was J. F. Parsons, of Joliet, who spoke on "Can we Succeed Without a Chicago Connection?" He advocated that Chicago suffered more for the want of an Independent system than did the Independent companies from being shut out of the city. He scored the Bell system for its high-handed methods in dealing with subscribers in cities where it has a monopoly, and that competition by Independents always brought the Bell people to time. The statement was made that the Illinois Tunnel Company was not a bonafide Independent company, but a part of the big corporation's system, and that this company sought to repulse the Independent lines and keep them from entering the city of Chicago.

Mr. Cheadle's "How and Why to Organize" was the

first number after lunch, and he was followed by Mr. E. C. Hennis, of the Northern Illinois Telephone Company, of Sandwich, Illinois, with a talk on "Mutual Interdependence of Independent Companies."

Joseph Balliot read a paper on "Relations of the Business Man to the Telephone Company;" Mr. F. W. Murray on "Fixing Toll Charges," and E. Hargreaves, of Manhattan, Illinois, on "How to Organize and Operate a Farm Line Company." Professor J. C. Kelsey's paper on "Does it Pay to be a Bell Sublicensee," follows:

"There is a fable, written two thousand years ago by the slave Aesop, which tells of the fox that had fallen into a well. A passing goat, hearing his cries, halted at the mouth of the well and heard him describing in rapturous tones how sweet was the water and how cool it was away from the hot sun. The goat jumped into the well, and the fox, by the aid of his horns, made a successful leap to the top. As he ran away he gave the goat some excellent advice, 'Look before you leap.'

"The Central Union Telephone Company is like the fox in the well. They want to get out. They are describing the sweet water and the cool air. Yea, they go farther, and tell of the advantages of long distance connection.

"The passing goat is like unto the successful Independent Telephone operator. Very few unsuccessful operators are importuned to go sublicensee. They want a successful operator, a goat with long horns, who will give them a good foothold for a leap out of the well of ruin.

"Look before you leap. What can the Central Union Telephone Company offer to an Independent operator? Not amnesty—not reward. Only long distance connection to Chicago, Boston, New York and a few other un-American cities. Is this worth leaping into? I have stated in a previous convention that if an Independent operator had supremacy in his own county seat or leading town, he had gained ninety per cent of his battle. If he connects the smaller outlying towns of his county and reaches a great number of influential farmers beside, he has gained nine per cent more. There is still a little more of his world to conquer, that is, that which bears on one per cent. That one per cent represents the advantage to gain by calling people outside of his county.

"Let us take practical examples known to me: Did Mr. Wasson's success in his district depend on anything outside of Clinton and locality? No! Did Mr. Savage's success at Champaign depend upon toll connections with Danville, Lafayette, Chicago and Boston? No! Did Mr. Glass's success at Pekin depend upon Peoria and Chicago? No! Has not the Interstate Telephone Company built up a powerful interest without Chicago? Yes.

"Has not Mr. Wasson gained 99 per cent of his

fight? And has not Mr. Savage also won 99 per cent.? and Mr. Glass also? How many more subscribers will each add to his list, if Chicago and Boston are added to their calling list? Such a statement would not cause a single extra heart beat in any present subscriber's bosom. If they went out now and solicited business with a stone wall built around their districts, their subscriber list could nearly be doubled.

"Why should Aesop's goat have jumped into the well for cool shades and sweet waters, when there were 99 other places with equal advantages?

"Now supposing the Independent operator listens, and jumps into the sublicensee well. The Bell fox gets out of a ruinous hole, gloats over his cunning from a safe place like Boston, and sends out newspaper reports to his neighbors and to his neighbor's bankers, and tries to instill fear and lack of confidence into brave hearts.

"The operator who jumps into the sublicense well loses what? He loses his self-respect. He is conscious of wrong doing. He suffers. He violates a modification of the law "that he who putteth his hands to the plow and looketh back shall not enter the kingdom of heaven." In a worldly sense, he has looked back, and violated his neighbor's rights and cannot enter into relations with any man without suspicion. He is a traitor to a just cause.

"What else? He falls into bad and extravagant company, a company of visionary leaders. A company with few, oh so very few, hard headed business men. He will emulate the Bell exchanges, and soon fool ideas will sweep away his earnings. And when he is stripped of his usefulness, at the mercy of the parent company, his life time earnings gone into useless improvements, he is kicked into outer darkness.

"Providence in his all-wise way, only permitted this invention in the age it could be made useful. Then in his inscrutable way, he made the judges give Bell the monopoly. For a purpose? Yes! It showed to the world that it is no more possible to monopolize the telephone than it is to monopolize the air. There is nothing in the world that has so few of the ear marks of natural monopoly as the telephone. Like the fresh air, it is a natural individual right. Some day a group of men at Boston will realize this, if they have not already. The Bell Telephone Company is doomed to miserable failure. It is as real to me as life. It is a sinking ship. People do not embark on sinking ships. It may pay, but it pays only in life insurance. Therefore, my friends who contemplate a leap into the sublicensee well, look you! It will pay you only in final and grievous heartbreak."

Election of officers for the ensuing year resulted as follows:

President—A. J. Vernier, Eastern Illinois Independent Telephone Company, Kankakee.

Vice-President—E. C. Hennis, Northern Illinois Telephone Company, Sandwich.

Secretary-Treasurer—J. C. Joslyn, DeKalb County Telephone Company, Sycamore.

### An Apology

In my article in the May SOUND WAVES entitled "Pole Changers, the name of the company making the pole changer illustrated in figure 9 was omitted. This was accidentally left out. The name of the company is The Current Electric Company, of Chicago.

W. A. TAYLOR.

## "District Organization"

CHARLES C. DEERING.

I am tempted to read a paper prepared by O. H. Seifert, of Eddyville, and presented at a meeting of the South Eastern Association last fall. The paper was entitled, "The Ideal Association," and Brother Seifert has the right system.

I am a believer in the Ohio plan of organization which provides for a number of districts, ten, twelve, fifteen or perhaps even more in Iowa. The territory of a district should include companies who have much in common, whose business interests are largely mutual. The district associations should be officered by active telephone men, thoroughly alive to all the advantages of their positions. District meetings should be held at least quarterly. The small territory of the district would mean but small expense for railroad fare or time to those attending, and the close mutual interests ought to bring out every telephone man, the large exchange manager and the small mutual man. At the meeting, quoting from Brother Seifert, "when you see a man with a telephone face don't wait for an introduction but step up and tell him your troubles. If you have time, listen to him; if he hasn't any, he's bogus, he's not in the telephone business."

The best results can be accomplished when every telephone company, big and little, belongs to a district association, and the Independents will not be satisfied until the best results are in sight. At the district meetings the

greatest good will come, not from discussion of the paper with most high sounding title, but the exchange of ideas about our daily troubles, our methods of doing this or that piece of work, and above all, from the acquaintances and friendships formed, which will do more than aught else to avoid the friction too often existing between neighboring companies. Here the chances for troubles of the latter kind will be aired and remedies found and applied. Here the minor questions of territorial rights will be settled. It is impossible to over-estimate the good that can and will be done by these district associations.

The plan further contemplates state associations, delegate bodies, made up of representatives elected by the district associations. All will be welcomed at the state meetings and will have opportunity to hear the program and take part in the discussions, but the work will be done by the delegates. I believe the state association should have a salaried man in the field, an organizer; a man whose business it should be to line up the companies not members of any association, point out to them the straight and narrow path that all the faithful should walk in. A man who would be sent to see the weak-kneed brother who is considering a sub-license contract, bolster him up and if his weakness is due to real or fancied troubles with other Independent Companies, see that he gets justice. He should be a practical telephone man if possible and able to assist and advise new companies and older ones, too,

for many of them are in need oft times of the assistance of a man whose judgment can be relied upon.

The State association should have maps and data from all Independent companies. Such information is often wanted. We were called upon recently for such data by the Nebraska Association at the time of a meeting with the Commercial Club of Omaha; the purpose, of course, being to secure their aid in getting a franchise in Omaha. Such data is often useful in affecting a raise in rates. Such data would interest prospective purchasers of securities.

The Clearing House Company is a protege of the association, and every toll line man here who has not already done so should immediately investigate this proposition; do not delay, do not wait until every neighbor has gone into it, but look it up thoroughly, and do it now.

Legislation and litigation should be watched by the state association. Endless trouble and much expense has been saved the telephone interests of this state in the past by an active committee. Bills are often presented in good faith which would be of benefit to a particular locality but which would work much hardship to the craft in general.

The larger questions of territorial rights, long distance toll lines, mutual insurance perhaps, and others would also receive attention at the state meetings.

The state association will send delegates to the National Inter-State Telephone Association. This body will also have on file maps of all Independent lines; it will gather data from all the states showing respective strengths of the Bell and Independent Companies as to exchanges, subscribers, rural subscribers, iron and copper toll lines, etc.

It will conduct a press bureau, a department of publicity, that the world at large may know that we are doing things, that the people may know that another spring has been discovered and that the fount of all wisdom at 125 Milk Street, Boston, has a rival.

The National Inter-State's Commission on legislation and litigation will have similar duties to that of the state Association and in addition will keep in touch with patent litigation. Few realize the patent litigation work carried on by the old National Association.

The National Association will have standing com-

mittees in addition to the one just mentioned on "Standard of Accounting," "Standard Operating Rules," "Standardization of Equipment," "Best Methods of Advertising," and perhaps others.

Much good can be accomplished by following the report of the committee on "Standard Forms of Accounting." Comparisons of costs between different companies are almost worthless unless the accounts are similarly kept. Of course, the large company will keep a finer distribution than the small one, but this merely means that the accounts kept by the small company will be subdivided. Comparisons of costs of operation, as to salary accounts, materials and supplies and similarly costs of maintenance will assist all of us in keeping our expenses down.

Standard operating rules are of importance, too; more so in the handling of interchanged toll business than in local work.

Similarly standardization of equipment is of great value in connecting up toll circuits for interchanged toll and long distance business.

All of these organizations will work hand in glove for the furtherance of a common cause. Each will do its share in encouraging Independent enterprises, the building of exchanges where we now have no connections, the construction of toll lines for more direct or longer distance service, the strengthening of the weak links.

To get results the telephone men must not only be members of Associations but must realize the results to be gained by co-operation; they must be workers in season and out, especially outside of convention gatherings.

This kind of work will cost some money but the end will justify the means. We cannot get something for nothing. If we can by the expenditure of a little money bring about a great, strong machine in which each will have a place and yet friction be reduced to a minimum, we will have the best possible insurance as to the stability of our properties, the best guarantee that no broken cog will stop the entire machine.

Let us place the National emblem on our banner and adopt for our slogan, "Look for the shield."

[Delivered at the meeting of Independents at Des Moines, Iowa.]

## The Man on the Road

### "He Explains Things"

"Have good luck this trip?" asks the Sales Manager as the Man on the Road came into the home office one bright morning. "Yes, rather more than expected considering the fact that a whole week was knocked to pieces in attending a convention."

"Well, you ought to have done a magnificent business if the size of your expense books are anywhere in ratio to the amount of business done, for the last three weeks certainly were the limit," sarcastically remarks the Sales Manager, doing his very best to look dignified and severe.

"Hold on a minute," said the Man on the Road, "just wait until I get fully inside the office and have half a

chance to draw a breath before you commence to shoot it into me."

"In the first place let me explain that business and expense are in a ratio but the ratio is inverse, the smaller the business the higher the expense; because I do love to add figures and if the total on business does not show high enough to suit my asthetic tastes I have to turn my energies in some other direction and they very naturally fall toward that cute little work I am editing, the swindle sheet. Therefore do not be angry at my little endeavors but just remember that the best preparation for the future is to be happy now and there is no medicine equal to a merry laugh. Try laughing a little and maybe afterwhile you will be able to see the funny side of that little book in the manner I now do."



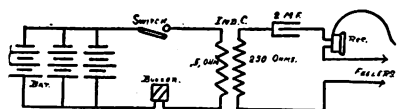
"But are you not afraid that we will fail to see things in your light and call in the headsman?" asks the Sales Manager.

"Never," says the Man on the Road, for fear is the rock upon which the barque of progress strands and as I feel particularly progressive this year I have no intention of being shipwrecked.

"But what is the use of arguing the question of expenses when there are so many other things to talk about.

"By the way, I took a drive of ten miles out to a rural telephone meeting the other day and was introduced by the chairman to the assemblage and requested to tell them what I knew of the telephone situation in other parts of the country. This I blushing consented to do and gave them about a half hour talk, then as gracefully as was possible withdrew from the rostrum. At this point the chairman beckoned to four other gentlemen in the audience and the five withdrew to an unoccupied corner of the room. There in deep consultation they remained for about three minutes at the end of which the chairman again mounted the platform and announced in stentorian tones that the executive committee had voted a vote of thanks to the Man on the Road for his highly elevating talk. Now what do you know about them having to call a committee meeting before they could thank me? I afterward learned that the chairman was a college graduate and the truth of that old adage stuck out strong, 'a five thousand dollar education grafted upon a hundred dollar boy produces no fruit.'

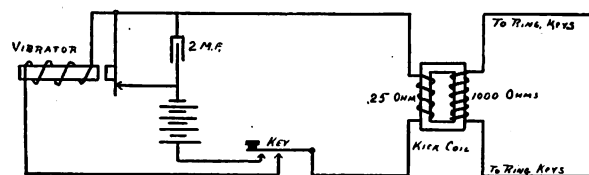
"On my way to the convention I stopped in to see a fellow that was changing over some cables and he was sorely tried trying to test the pairs in those cables without continually signaling the operator, as it was a common battery board, or disturbing the subscribers' instruments. Of course upon my arrival he immediately threw his arms around my neck and with tears in his voice begged me to show him some way out of the deal. Naturally after such a reception it was up to me to solve the dilemma and accordingly after a little scouting around I found a local battery induction coil, a 2 M. F. condenser, a buzzer and some battery, then rigged up a little stunt in this shape:



"You can readily see that the interrupted battery current passing through the primary side of the induction coil would give a high frequency alternating current of high potential on the secondary side, and upon the completion of the secondary circuit through the pairs of the working cable, would give a loud tone in the receiver. Yet on account of the small amount of current and the high frequency of same it would not ring the subscriber's bell or cause the relay in central office to operate. In passing I suggested that it might also be a good thing with which to knock a few rubbernecks off a heavily loaded rural line."

"Using the induction coil as a transformer, eh?" asks the Sales Manager, "and say, bye the-way, do you ever run up against any of those kick coil instruments that were put on the market some months ago?"

"Every once in a while and find them working in good shape, too, says the Man on the Road, and I find they are a pretty good stunt in more ways than for which they were intended; for instance, over at Rural Valley the other day I happened along just in time to find the switchboard generator and the pole changer on the 'bink,' so I pressed into service one of these same kick coils and with ten cells of dry battery I soon had the system merrily running and the rings going out as good as ever before. Simply connected them up in this shape:

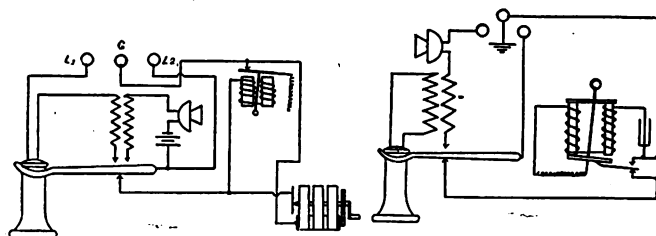


"The diagram explains itself and even though your comprehensive abilities have a limit, I am sure you can readily see through this simple proposition."

"Agreed," says the Sales Manager, "but what did you see at the convention that was of especial interest?"

"There were a number of new features exhibited but one that particularly caught my eye was a new four-party selective system that so far as I could judge, will obviate the inherent troubles of frequency, harmonic, pole changer or machine ringing, and, altogether, was about as simple a method of accomplishing the desired result as any I have yet run across.

"This is by using simply ordinary dry battery current positive or negative to ground as desired with a spring attached to the armature of each ringer and opening and closing the circuit according to the movement of the ringer, or in other words getting back to the vibrating bell principal. This is the circuit of one of the local battery instruments so wired.



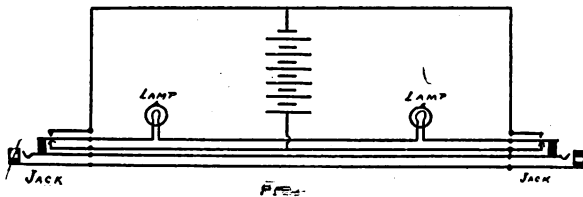
"Then on a common battery instrument they simply add another contact for the spring and inserting a condenser in the circuit, cause the charge of the condenser to actuate the armature and as the spring makes contact with the other point the condenser discharges to ground and the armature by the aid of the spring returns to normal only to again charge the condenser and thus keep up a rapid vibration just so long as the current is held on the line by means of the ringing key. The common battery instrument is wired in this manner.

"The man in charge of the above system stated that on their first installation which was of one hundred and fifty instruments they did not have to adjust a single

bell, and as he looked like an honest young fellow, if there are any in the telephone field, I have no cause to doubt him or dispute his word."

"All right, just keep your eyes open for anything new and don't forget to report. By-the-way here is a letter from the manager up at Hedge Hollow who says he wants to install a lamp transfer in his board up there; answer it as I am too busy," says the Sales Manager, handing over the letter.

"Well here is the easiest way I know out of that problem," answers the Man on the Road, "just have the stenographer answer this letter and enclose this:"



"When are you going out again?" asks the Sales Manager. "To-morrow, perhaps," answers the Man on the Road, "just at present I must go home and get acquainted with my wife as I haven't seen her for about a month."

And then the Man on the Road makes tracks for the nearest department store to purchase a peace offering for the aforesaid wife to offset in a measure the call down that is due him because he did not return a week earlier, as he had promised.

Mr. B. F. Wasson, of Clinton, Ill., prominently connected with the Independent movement in that state, recently delivered a lecture on "Telephony" with illustrations, before the senior class of the Clinton High School. Mr. Wasson first took the class to the opera house, where he discussed the evolution of the telephone, exhibiting a model of the first, called the lovers' telephone, and also exhibiting models of all kinds that have since been used, including the latest patterns. Then the class was taken to Mr. Wasson's shop where he explained the materials and tools used; thence to the supply room, showing the different kinds of wire with which the lines are built and lastly to the telephone exchange, where the students were shown the mysteries of the work of the operators. This lecture was more interesting and instructive than any knowledge that could be taken from the different works on telephony because of Mr. Wasson's long experience and the great amount of time he has spent in the study of the subject. It is needless to say that the class highly appreciated the opportunity and warmly thanked Mr. Wasson.

Plans for the forming of an association of telephone subscribers, with its object the fighting of the granting of a new franchise to the Chicago Telephone Company, were formulated at a meeting of business men in the offices of the law firm of Atwood, Pease & Louchs in the Tacoma building Chicago, recently. Just how far the movement progressed was kept a secret, but that the project was beyond the embryo state was admitted by those at the conference.

## INDIANA'S CONVENTION.

The first annual convention of the Indiana Independent Telephone Association was held at Indianapolis, May 17 and 18. The following program was carried out:

THURSDAY, MAY 17.

Morning Session, 9:30, Registration, Meeting of Committees, Enrolling New Members.

AFTERNOON SESSION, 1:30.

Call to Order, Address of Welcome, Hon. Charles A. Bookwalter, Mayor of Indianapolis. Response, George W. Beers, President of the Association.

Reading Minutes of Last Meeting. Report of Officers, President, Secretary, Treasurer, Vice-Presidents:

- 1st District, Theodore Thorward,
- 2nd District, Wm. L. Moellering,
- 3rd District, Walter J. Uhl.
- 4th District, J. A. Browne,
- 5th District, O. P. Friberg,
- 6th District, Earl Talbott,
- 6th District, W. W. Mendenhall,
- 8th District, A. C. Lindemuth,
- 9th District, W. D. Curl,
- 10th District, Chas. D. Knoefel,
- 11th District, Fredk. Whitcomb.

THURSDAY, MAY 17TH,

EVENING SESSION, 8:00 O'CLOCK.

Refreshments		Electric Punch
Insulated Wafers	High Tension Cigars	
	Metallic Music	
	Montani Bros.' Orchestra	
	Toll Line Messages	
Initial Period 5 Minutes	Overtime \$5.00 per Minute	
Jesse W. Weik	Chief Supervisor	Greencastle
	A Lecture to the Operators	
	First Position	Wabash
Dr. R. F. Blount	Birth of the Association	
	Second Position	Richmond
A. C. Lindemuth	Ten Month's Progress	
	Third Position	Indianapolis
M. L. Clausen	Discipline	
	Fourth Position	Connersville
L. A. Frazee	Independents vs. Monopoly	
	Fifth Position	Rockport
A. J. Payton	In the Enemy's Country	
	Sixth Position	Winchester
J. A. Browne	County Organization	
	Seventh Position	
	Eighth Position	New Albany
C. D. Knoefel	When We Had No Toll Lines	
	Ninth Position	South Bend
Theodore Thorward	Why Independents Win	
	Tenth Position	

FRIDAY, MAY 18.

Morning Session 9:30. Report of Committees, Appointment of Committees. Address: Independent Telephone Securities, Col. J. D. Powers, Louisville, Pres. Commonwealth Life Insurance Co. Presentation New Business. Appeals and References.

Afternoon Session, 1:30. Reports of Committees, Election of Officers, Election of Delegates, Miscellaneous Business, Adjournment.

# The Ideal Manager

There is perhaps no one subject connected with the whole business telephonis, upon which there might be such a diversity of opinion as the one assigned me by our Board of Arrangements—that of

## The Ideal Manager.

This is occasioned by several reasons, among which may be mentioned geographical location, local environment and the conditions that obtain. No two exchanges are exactly alike, either in size or general condition, and what would apply and be requisite in one case, might not be necessary in another. Each manager is supposed to be trying to serve his patrons with the maximum amount of prompt and efficient service with the minimum amount of cost, and to maintain the balance on the right side of the ledger.

So while it would not be possible to define any specific rule for the management of an exchange, perhaps a few suggestions along general lines might be of interest, or at least serve to offer points for discussion, which are always instructive and beneficial. The charm of a convention being the interchange of thought and the practical ideas brought out.

The larger the exchange, the more departments will be found necessary, but as the Mountain state has but few of the larger plants, what I shall say shall be mostly from my own experience, and intended to be of value to the association. So trusting that my remarks may be received in a spirit of charity, I proceed.

Our ideals should at all times be just a little in advance—something we are striving to attain—constantly nearing but never quite reach. The individual who has reached perfection in this life, or is satisfied with present results, has no place in a telephone exchange.

No one can doubt the fact that the telephone exchange, as we find it today, is one of the most important business factors in this progressive age. The old adage 'time changes and we change with it,' is particularly emphasized just here. A few years ago the telephone was regarded as a scientific toy, but what would the world at large do today if this creation of silk-covered wire, hard rubber and iron was eliminated from the field? It is not likely to be, although a company of Boston capitalists has a monopoly for seventeen years. Time changes, you see!

The manager of a plant of say 1000 subscribers, who should be a thoroughly practical man, is supposed to know how to install a station, and know when it is done properly, remedy an instrument trouble, locate and repair a trouble in his board, and in an emergency don a pair of climbers, climb a pole and be able to do something when he gets there. The ability to make an accurate measurement with the bridge, know how to open a cable, make a repair and wipe the joints when he has completed the work, are accomplishments that renders such a man a valuable asset in the stock of a company. The cost of the various items that to make up a plant, poles, wire, insulators, brackets, braces, arms, batteries, cords, hardware, instruments, etc., change frequently and constant inspection of discount sheets is necessary if the manager would know where and how to buy. Eternal vigilance is the price of steady, eco-

nomical growth, as well as of other things we have been advised of.

The manager, while at all times the head of the exchange, should have able willing assistants, and their hearty co-operation is essential to the proper operation and maintenance of the plant. Frequently and regular consultations should be held, and plans and suggestions looking toward the betterment of the service discussed. Friction between the employees should be disapproved, and petty jealousies, which frequently appear should be promptly smothered. No partiality should be shown, but I have found that a word of commendation to an operator or other employe, who constantly endeavors to make him or herself agreeable to everybody, who considers the company's interests theirs, is well expended. The annual vacation of at least a week on full pay, brings to the company an increased revenue in good will, appreciation and a desire to please. The finest system in the world, most up-to-date board, modern instruments and all that goes to make up an exchange, amounts to nothing if the operating force is not in keeping. I place the greatest stress for the success of an exchange upon the operating force. There are those who claim the automatic to be the ideal exchange, and while I have not had personal experience along this line, I have never been able to see the advantage over the manually operated board. In this regard I claim to be from Missouri.

The manager should keep posted in his business through the technical press—and we have some ably conducted periodicals—be able to discriminate between a practical appliance and a catch-penny invention, and be ever ready to give to this company the benefit of any new device for the betterment of the service, or the reduction of expenses. I would not suggest the frequent changing of apparatus or the addition of new makes of instruments, lest he soon find his exchange filled with a heterogeneous collection of instruments, which necessitates the expenditure of too great a sum in the way of duplicate parts. One, not more than two kinds of instruments at best, are all that should be used, and in this way a standardization of apparatus is possible—and this is a consumation devoutly to be wished.

The manager should not be so overloaded with duties that he be kept in the position of a clerk, but should have competent help, in a bookkeeper, collector, day and night chiefs, wire chief, inspector, and sufficient linemen to keep the construction work well in hand, as well as to keep the plant free from accumulated trouble. The chief operator who has charge of the operators, the wire chief who handles the board, inspectors and linemen, and the bookkeeper who looks after the collections must work in harmony with the manager, and be held responsible for the work in their several departments. A system carefully worked out and strictly adhered to, which embraces punctuality, civility, decorum and above all discipline, makes the operation of any sized plant what it should be—an aggregation of intelligent employees working for a common purpose—the surrender of their time, talent and energy for a momentary consideration that increases as the operative merits.

Few of us have exchanges that do not have competition—in some places strong—in others not to be considered—with our esteemed contemporary,

the Bell Company. Just a passing word here and I am done. Thanks to our fearless Independent press, the true position occupied by the Bell Company is now well known, and they deceive no one who reads. A battle is now on, between a company with years in the field and millions to spend, on one side, and in indignant victimized people on the other. This fight is to a finish, and nothing will be left undone on the Bell side to stifle competition, tie up a Farmers' line or kill an exchange. Keep their actions in the past before the public, render the best possible service to your subscribers, ever striving to exceed past records, and you will eventually find that the Independent shield, with its colors recognized, loved and feared throughout the known world, and that has never known defeat, will triumph.

Invention of any public utility is a great event in the life of the people. We have witnessed the invention of the steam engine, its application to navigation and railroads, and have seen its marvelous growth. The telegraph also has welded the world into one nation as far as communication is concerned. But it remained for the telephone to transmit the human voice and bring distant cities and towns in closer touch. The rapidity of growth of these different inventions has been very great, but in comparison the telephone has outstripped them all. Its growth has been marvelous.

The business of telephony is as yet in its infancy. It has passed from the category of being a luxury to that of being a necessity in business and the home. It probably touches the people more closely than any other public utility. The telephone was first used in 1876, and from that time on almost exclusively by the Bell until 1894 when the patents expired, and the increase from this period 1894 to the present time has attained the remarkable record of something like 2000 per cent.

There are some 500,000 stockholders in the Independent telephone companies, and the Independent telephones outnumber the Bell telephones in the United States three to one. This notwithstanding the fact that the independent telephone companies have not been able to establish centrals in many large cities such as New York, Chicago, Cincinnati, and Washington. But an Independent company has finally found a franchise that will enable it to enter New York, and they promise that inside of three years that they will have 250,000 telephones whereas the Bell has 175,000 in New York.

The progress that is being made in which the whole country will soon be united warrants the prediction that in the near future there will be another telephone company thoroughly united and harmonized that will compete with the Bell and maintain a lower rate for service than obtains under the monopoly. To-day people are receiving service at a rate so as to maintain two telephones where before the advent of Independent telephony they were unable to secure one, the rate being prohibitory.

The development in West Virginia, while it is not remarkable in some sections, in others has had a very rapid growth. There are some eight or ten large strong companies in the state that they have a very large volume of business, and these with their allied small companies are doing much to cripple the Bell monopoly until it is forced to give free telephones for a certain period, give a free residence telephone with a business telephone, and the lowering of rates in certain sections below what business can be done for, and in other and various ways to put the Independent telephones out of business. The public cannot be so easily deceived; they know that had it not

been for the Independent movement they would be practically without telephone service because of prohibitory rates.

The first exchange probably of an Independent telephone was in 1892 at Clarksburg, when Moore Jackson, C. L. Hickman, Dr. Morgan and others purchased some telephones and started a small switchboard exchange, the line running from Clarksburg toward Weston. Suit was entered by the Bell Company and these telephones were confiscated and burned by order of the court in the public square. But it was a conflagration that served only to stir the hearts of these people the more, and in 1893 the Clarksburg Telephone Company was organized, and the fight renewed. The exchange became a fixed fact and success, and out of it has grown as the present company the Consolidated Telephone Company embracing allied companies in several counties.

In July 1896 there was organized the Central West Virginia Telephone Association for the mutual protection and advancement of all Independent telephone interests in West Virginia. This association had several meetings, but the records do not show how often these meetings were held, and I am not advised as to how long the association existed, but I found a constitution and some minutes that stated that the Central West Virginia Telephone Association met at Clarksburg, on September 17, 1901, and that Mr. Jno. Koblegard was president and that at this meeting Mr. H. C. Henderson was elected president for the ensuing year. At a meeting at Fairmont in 1902 the association disbanded by reason of the fact that there was a disagreement over plans for employing a man to look after and equalize the tolls between the companies. In May 1905 a call was issued for a convention by Mr. A. C. Davis, at Parkersburg asking all the Independent telephone companies in the state to meet for the purpose of organizing anew the West Virginia Telephone Association in order that the state might be represented in the National Inter-State Telephone Association in June 1905. What was done at this meeting the minutes of the secretary will show.

A perfect state organization of the telephone interests is almost impossible so long as the companies are so scattered and dependent on their resources for support, because of the limited number of toll lines in the state to furnish an interchange of business. The object of this association as we see it is to form such a union as will more firmly cement the Independent interests, to promote uniformity of operation, construction, and equipment, and to defend by co-operation the different companies, and to give all moral and legal support in any aggressive movement against the common enemy, to procure the enactment of such legislation as will be to our best interests, to interest home capital and home people in our enterprise, to devise ways and means to protect the companies against the attacks of the opposition, and to aid by judicious advertisements and maps as may be for our best interests.

The great needs of the Independent telephone companies in this state to-day are, as I take it: First, a traffic association of some character, in order that an equitable division of tolls can be made between the companies for long distance business. Whether or not the different companies should join the Eastern Traffic Association; or whether we should adopt Mr. Handlan's suggestion of pooling all toll lines on the basis of cost is to be determined, or continue in Tri-State Toll Association. Second, the settlement of all disputes should be



according to the rule recommended by the board of directors of the National Interstate Telephone Association, that is by arbitration. The president would state that the executive committee has in a manner divided the State into districts, so that one member of the executive committee of the association is assigned to each district, and that all matters and disputes should be filed with him, and he then should call in two other members of the executive committee from other districts to act with him. Third, the proper dealing with rural lines or mutual telephone companies which is probably the most important question to come before the association and which is to be fully discussed in papers before this assembly by gentlemen fully competent and prepared to give pertinent recommendations. Fourth, we should

have a committee on legislation and a committee on traffic. Fifth, there should be a map made showing all toll lines of the different companies with their connections. This matter is of great importance and should be placed in the hands of the committee.

In brief I have attempted to sum up the situation, and there is everything to encourage us to go forward to meet the competition that we have that is not of the fair, open sort which we like, but is covert and underhanded, even posing under the name of Independent companies in order that it may answer its ends.

By Lon H. Hutchinson.

[Delivered at Parkersburg, W. Va., before convention of West Virginia Independent Telephone Association.]

## Warning to Investors

President James B. Hoge, of the National-Interstate Telephone Association, sends out the following, which is of interest:

"Some of the paid representatives of our opponents are, apparently, very much exercised about the investing public becoming interested in Independent telephone securities claiming their people have recently arranged for large amounts of additional money which is to be used in purchasing Independent properties and fighting the Independents. No one thoroughly in touch with the Independent situation will be at all frightened by such threats. In the past, the Bell people have spent several hundred thousand dollars of their funds in buying out a few poorly constructed properties at fabulous prices. In practically every case, new up-to-date Independent exchanges have been built to take the place of those sold, and the new companies have proven stronger and more successful than the ones purchased. A few instances that might be cited are Toledo, Ohio; South Bend, Indiana; Detroit, Michigan; and Portland, Oregon.

The Bell has recently spent considerable money in buying out some of the Independent properties in Missouri, generally paying from two to three times what they were actually worth. Among these are Kirksville, Carrollton, Monett, and Pierce City. The city councils at Kirksville and Carrollton have already granted new Independent franchises, and these cities will be re-built by the Independents at once. The Pierce City and Monett people have offered the Independents a franchise in each place, which will be taken up at an early date, and these cities will also be re-built with up-to-date Independent exchanges. About a year ago, the Bell purchased a controlling interest in the Independent company operating at New Lexington, Ohio. The Independents recently secured a new franchise for that town, and are now making active preparations to re-build. In each of the instances just mentioned, the people have pledged their support to the new Independent company, and the Bell's investments in these towns have gone for nothing. There is no doubt, however, they will continue to spend more of their money in buying out the properties of other weak companies in the hopes of stampeding the Independent movement.

They seem to overlook the fact that Independent telephony is far beyond the experimental stage. The Independents were weakest when the movement began. Every month is adding to their strength.

Numerically, we are stronger than our competitor. If necessary, we can readily afford to let them make further purchases, and still have more telephones in service than they; especially in view of the fact that the Independents are increasing upon an average of 50 per cent. faster than the Bell. Besides, as proven by past experience, their difficulty seems to be to retain control of the towns they purchase.

We have more than fifty times as many investors in our securities as the Bell. Our investors are not confined largely to old estates. Over 75 per cent. of those having their money invested with the Independent movement are people who are active, and following up their investments in a businesslike way which enables their companies to get the cream of the business. In this connection, I should like to quote from a recent address made by Mr. J. H. Shoemaker, of Iowa:

"Think of Iowa, with its hundred counties and only two or three individuals representing our opponents who have authority to determine how far the tactics of today may depart from the former fixed policy in any given case. Then think of the Independent men, who are not only in every one of the hundred counties or all of the sixteen hundred townships but in nearly all of the fifteen thousand school districts as well."

We have no record of Independent telephone companies giving away telephone service free, as our competitors are doing in so many places, in order to hold the business. Neither do the Independent people seem to find it necessary to carry in their directories the names of people who are no longer subscribers in an effort to deceive the public regarding their real strength. This is a common practice with the Bell.

Every Independent man knows that the properties he is looking after are growing and demanding his attention. This situation is general. Judging from reports already received, if the Independent companies would all report to one central point, the amount of new money they are going to invest this year, it would be found far in excess of the amount which representatives of our competitor brag about in a "confidential" way to bankers and brokers as

being appropriated (?) to buy out the Independents' properties and injure their securities.

Don't be stampeded! Any one who has money invested in Independent securities today has a good invest-

ment in a growing business. Independent securities are steadily increasing in value and occupy a higher place in the financial world than ever before—"confidential" Bell statements to the contrary notwithstanding.

## Michigan Independent Telephone Ass'n Meets

The ninth annual convention of the Michigan Telephone Association was held in Ann Arbor, Mich., March 22-23, 1906. The Hon. E. B. Fisher, President of the association, called the meeting to order at 2 o'clock P. M., on Thursday, and read his report, which in an interesting manner covered the growth and conditions telephonically in the state for the past year, and reviewed the general conditions at large.

Upon motion of Mr. C. S. Bartlett, Pontiac, it was voted to have 500 copies of the President's annual report printed and distributed to the members of the association.

A communication from Mr. J. B. Hoge, President of the National-Interstate Telephone Association, was read by the secretary, Mr. J. B. Ware.

An invitation to inspect the grounds and buildings of the University of Michigan was received by the convention, and upon motion of Wm. Robinson, Muskegon, the invitation was accepted, and 8 o'clock Friday morning fixed as the time to start from the building of the Home Telephone Company.

Mr. Ware moved a committee of five be appointed to consider and report at the morning session Friday, as to the recommendations contained in the paper from President J. B. Hoge, which motion prevailed, and the following were appointed: R. B. McPherson, Howell; W. J. Melchers, Alma; W. A. Young, Benzonia; N. F. Wing, Grass Lake; and F. C. Hughes, Lansing.

The following telegram was received from President Beam of the Ohio Telephone Association, dated Mt. Vernon, Ohio, March 22, addressed to Mr. Fisher, President of the Michigan Association:

"Impossible to be with you tonight. Have written. Best wishes for a successful meeting. (Signed) Frank L. Beam."

A similar telegram was received and read, from Mr. J. B. Hoge, Cleveland.

Mr. W. O. Hunt read a paper on "Progress and Prospects," and it was followed by a very profitable discussion, during which Mr. M. A. Porter, Northville, gave details as to the present Bell tactics in trying to establish an exchange; and Mr. N. F. Wing graphically explained the advantages to the Independents, by reason of the sale of the Rives Junction exchange, so-called, to the Bell Company; and Mr. C. E. Tarte told of the Newaygo County situation.

The Rives Junction sale was of property consisting of old Tamarac pole lines, some fence wire and the central office in town. The best lines and all the telephones, as a rule, were owned by the rural company. The \$5050 paid was far beyond its value. The rural companies will put in a "central," and be stronger than ever, as Independents.

Upon motion of Mr. W. O. Hunt, Adrian, the chair appointed a committee on nominations, being W. O. Hunt, Adrain; Wm. Robinson, Muskegon; R. C. Smith, Homer, and Chas. Swaverly, Kalkaskia.

Upon motion of Mr. Tarte a committee of three was appointed to co-operate with the National-Interstate Ass'n. in having reprinted certain articles appearing in *Success* as follows: C. E. Tarte, Grand Rapids; C. B. King, Ann Arbor; W. J. Melchers, Alma.

Mr. W. S. Vivian read his paper on "Traffic Association Progress," which was followed by an adjournment until 7:45 o'clock P. M.

### EVENING SESSION—MARCH 22, 1906.

In the absence of Mr. H. H. Hutchins, Saugatuck, the secretary read his most excellent article upon "Rural Telephones." The paper was ordered to be printed for the association.

Mr. F. V. Newman read a carefully prepared paper on "Collections." Numerous questions followed, and many important items were brought out in the discussion of the paper, which appears in another column.

Mr. Max Koehler, St. Louis, Mo., and Mr. W. B. Woodbury, Detroit, entered the convention at this time. Mr. Koehler, who is the representative of the syndicate of St. Louis gentlemen who are financing the Home Tele. Co., of Detroit, addressed the meeting in a brief and pleasing manner, being followed by Mr. Woodbury, the general manager of the Home Company, Detroit. He stated the soliciting of contracts was but started, but the results proved that the people of Detroit are in sympathy with a new company with modern equipment. That the solicitors took 109 contracts "yesterday and today." The outlook is better than expected, and the work of constructing the Detroit plant will be pushed just as rapidly as strictly first-class results can be obtained. Mr. W. C. Polk is the engineer in charge, formerly having charge of the Kansas City's Home Telephone Company's plant.

Mr. H. P. Grouer, Grand Rapids, read a historical paper upon Michigan's cedar supply, and in answering questions gave much additional information.

The comprehensive paper on the "Indiana Outlook," by William L. Moellering, of Fort Wayne, was read by the secretary. The paper appeared in the May number of *SOUND WAVES*. Upon motion the same was ordered printed, as was also the paper read by Mr. R. M. Smith on "Southern Michigan."

At 10:30 o'clock the session adjourned, and the members attended a "Dutch Lunch," given by the manufacturers and supply men, who had exhibits. Mr. E. B. Fisher was selected to preside after the lunch, and informal addresses were made by a number of those present, including Mr. C. B. King, W. B. Woodbury, Mr. J. B. Ware, C. E. Tarte, H. P. Grover, C. O. Trask, A. S. Burch, M. S. Walker, C. M. Jones, J. C. Kelsey and C. D. Boyd.

### FRIDAY MORNING—MARCH 23, 1906.

After the delegates had inspected the University grounds and buildings, the convention was called to order at 11 o'clock, by the president.

After the roll call of companies, Judge A. J. Sawyer addressed the meeting in an earnest, enthusiastic and interesting manner. He referred to the former betrayal of the people of the state by the sale of the New State Telephone Company, to the Bell interests in 1900, and welcomed the legitimate Independent interests into Ann Arbor and Detroit.

Mr. Tarte reported as to the Traffic Ass'n. of the state, giving the list of officers as follows: President, C. E. Tarte, Grand Rapids; secretary, W. A. Young, Benzonia; Treasurer, H. A. Price, Saginaw.

Traffic Committee: C. E. Tarte, chairman; W. J. Melchers, Alma; H. A. Price, Saginaw; R. B. McPherson, Howell; C. Y. McVey, Cleveland, Ohio; W. A. Young, Benzonia; N. F. Wing, Grass Lake.

The calling of the roll of districts showed each had had a very satisfactory growth during the last year, in the increased number of telephones in service and in the miles of long distance and toll circuits put up.

The treasurer, Wm. Robinson, Muskegon, made a report, showing \$72.71 on hand. The secretary of the Association, Mr. Ware read his report.

Mr. W. H. Melcher, for the committee on consideration of address of President J. B. Hoge, reported, recommending:—First, that hereafter all members of this association use the "shield sign adopted by the National-Interstate Association; second, that the arbitration plan suggested be adopted; third, that the association should have a paid officer who should look after general interests of Independents throughout the state.

The report was received, and on motion of Mr. Chas. Seaverly, the recommendation as to use of signs was adopted. On motion of Mr. Tarte, seconded by Mr. N. F. Wing, an article to the association's constitution was formally adopted. On motion of Mr. Ware, the third recommendation of committee was referred to a special committee to consider and report at the next annual meeting, or at an earlier meeting to be called if the committee so requested. Committee was appointed as follows: E. B. Fisher, W. B. Woodbury, W. J. Melchers, H. A. Price, W. O. Hunt, W. A. Young, and Wm. Robinson.

Mr. Robinson reported for the committee on nominations. Mr. Young moved the report be adopted. Mr. John H. Fildew moved that the report be received and to proceed to ballot for the election of officers, which motion prevailed. The result was the election of the following officers for the year:

President, Mr. E. B. Fisher, Grand Rapids; Secretary, Mr. J. B. Ware, Grand Rapids; Treasurer, Wm. Robinson, Muskegon. The executive committee was selected as follows, in addition to the president and secretary, ex-officio members: Mr. W. B. Woodbury, Detroit; Mr. C. E. Tarte, Grand Rapids, and Mr. J. H. Fildew, St. Johns.

Election of delegates to National Convention and alternates, being in addition to one from each of the districts, resulted as follows: Delegates: Mr. J. B. Ware, Grand Rapids; Mr. W. B. Woodbury, Detroit; Mr. Frank Howard, Flint. Alternates: Mr. W. O. Hunt, Adrian; Mr. H. A. Price, Saginaw; Mr. B. B. King, Ann Arbor.

The president of the state association, Mr. E. B. Fisher, was again elected as a member of the executive committee of National-Interstate Association.

Mr. R. C. Smith, Homer, stated he had purchased and paid for B. B. iron wire, which when tested at the State University, had been proven to be steel wire. Upon mo-

tion of Mr. H. T. Clough, Owassa, the matter was referred to the executive committee of the Association, with full power to act. Adjournment.

### National Inter-state Convention

The program for the meeting of the National Inter-state Telephone Association to be held in the Auditorium Hotel, Chicago, June 26, 27 and 28, while only partially completed, furnishes a good idea of the interesting addresses that will be delivered at this convention.

Mayor Dunne will deliver the address of welcome at 1:30 p. m., afternoon of June 26, at which time the meeting will be called to order. President Hoge follows with his annual address, and then come reports of the officials of the association. The appointment of committees will close the first day's proceedings.

The second day, June 27th, will be called to order at 10 a. m., adjourning at 12:30 for lunch and reconvening about 2 o'clock. Mr. Ivy Lee, of New York City, who has made a specialty for a number of years on "Commercial Publicity," will make an address before the convention on the value of "Telephone Publicity," urging upon the delegates the importance of having the association establish a department to carry on this work.

Various state leaders of the Independent Association will then be called upon for remarks.

Mr. Shirley Johnson, of "Fiske and Robinson," New York City, will present a paper on "Independent Securities" Mr. R. A. Walker, general manager of the Central Iowa Telephone Company, Iowa Falls, Iowa, will present a paper entitled, "Look for the Shield."

"Official Organs—National and State," is the subject of a paper by Mr. Chas. S. Norton, secretary of the Indiana Independent Association of Indianapolis.

There are several other papers promised for this convention, which will be included in the programme at a later date.

"The Question-Box" will be a feature of this meeting by a special request of numerous Independents throughout the country. This is expected to bring out many important matters which will be taken up and discussed.

"Entertainment of Delegates" will be a feature of the second day's session, probably in the form of a banquet to be held about 8:30 p. m., at which a number of good after-dinner speakers from all over the country will be present. The object of having this on the second day is to give those a chance to attend who might not be able to stay until the close of the convention.

On the third day, the session will be called to order at 10 a. m., first hearing the reports of the various standing and special committees and discussions thereon. This, it is believed, will take up all the morning session. In the afternoon after hearing one or two papers read, there will be a roll-call of the states, election of officers and any new business presented and transacted, with adjournment between 5 and 6 o'clock.

In order to obtain the reduced rates which have been secured on all railroads in the country, those attending the convention must purchase through tickets and secure certificates from the selling agents. These tickets, after having been signed by the writer at Chicago, will be viewed by a special agent of the railroad who will be in attendance at the convention during the 27th and 28th.

The certificates will then entitle the holders to return on one-third of the regular rate, providing tickets were pur-

chased between June 21st and 26th, the same being good to return until July 2nd.

## "How Can We Improve Our Local Telephone Service"

W. M. BAILEY, RICHMOND, INDIANA.

The question of good service, I think, is the most important factor in the operation of a modern telephone system and I trust, at least, to be able to bring out some points that will create discussion.

There is no question that modern and up-to-date equipment are very important factors in the prompt and efficient handling of telephone traffic. To demonstrate this, in about 1894 and 1896 in New York and Chicago a number of tests were made with both the magneto and central energy systems. The results were as follows: Magneto local connection, subscriber ringing to operator answering, taking number, repeating, plugging in and ringing, 14.77 seconds. Subscriber called for answering in 24.98 seconds which makes a total of 39.35 seconds from time of calling to subscriber answering. The transferring to another board taking 23.1 seconds longer or a total of 62.45 seconds; the ring off requires 17.1 seconds.

A number of tests were made on the magneto transfer board at Richmond, Indiana, under the same conditions in January, 1906, with the following results: Subscriber ringing to operator answering, taking number, repeating, plugging in and ringing 7.20 seconds, subscriber called for answering in 17.35 seconds, which makes a total of 24.55 seconds from time of calling to subscriber answering. The transferring to another board requiring 8 seconds longer or a total of 32.55 seconds, ring off requiring 6.06 seconds.

Central energy multiple switchboard under same conditions, subscriber taking down receiver to operator answering, taking number, repeating, plugging in and ringing, 10.86 seconds. Subscriber called for answering in 21.84 seconds which makes a total of 30.39 seconds from time receiver is removed from hook to time subscriber answering this on a local connection. The transferring took 5.5 seconds longer, or a total of 35.89 seconds, ringing off 3.08 seconds. It can be readily seen that there is a great gain in time and most of it is in the operation at central. It is with regret that I have no up-to-date test showing the time saved on a modern double supervisor central energy multiple switchboard, but will admit under the same conditions at the present time the operating of either system would be much faster as operators are becoming more skillful and as the magneto test was made quite awhile before the central energy, I don't attribute all of the time saved to equipment, as operating had advanced during the time that elapsed between the two tests, a period of about two years; but there is no question that a great deal of time is saved and especially on transfer calls as every fraction of a second is very important when it is taken into consideration that on each section of a moderate size exchange there is from twelve to fifteen hundred calls handled daily. If we can save one-half of a second on each call, there will be a saving of from six to seven hundred and fifty seconds per day on each section or about two hours, and of course the time saved will greatly exceed these figures.

But the question that arises is, what can we do to improve telephone service with the equipment we now have whether magneto transfer, central energy or automatic. First with any of the three systems a close visual of the actual working condition of the plant to see that all troubles are promptly and carefully repaired, and repaired if possible so they will not return. Now that the equipment is in first-class repair we must then place our shoulders to the wheel of operation.

Our attention should first be called to the proper selection of chiefs and operators. First the chief operator holds a very important position. Therefore, this matter should have every possible care and consideration. The position requires a woman who possesses firmness, executive ability, tact and also the rare ability of being able to control others without the necessity of resorting to stringent measures. She should acquire a thorough knowledge of the characteristics, ability and temperament of each operator which will materially assist in the proper placing of them on sections of the board where they will be of the most value. The chief should maintain close relationship with the operators and at the same time have sufficient dignity and reserve to avoid familiarity. She should have a monitor on her desk and should spend a certain portion of each day listening on the different operators. This will also give her an opportunity of studying the various characters. She should keep the time book and other necessary records including a diary of the happenings during each day that are of importance to the proper handling of the service, also keep a record of each complaint and charge to the proper operator and report to the superintendent or manager anything that in her judgment is a detriment to the quality of service rendered and to make any suggestions that will improve telephone traffic.

Next, in selecting an operator care should be taken that you get a bright, alert, accurate and tactful girl, not too young still young enough to be malleable—one who has the ability to put subscribers in a good humor instead of irritating them; her hearing should be perfect, her voice sweet and clear, her eyesight good and her health also good, as it is a hard matter for a sickly or dyspeptic person to be affable. I have found from experience that the Irish as a rule make the best operators. This I attribute to their alert answer and ability to please with a little flattery.

Next, every care should be taken in the teaching of a student. She should be taught the great responsibility that rests upon her and to be pleasant and polite under all circumstances, even though the subscriber is rude and unjust. She should be taught all the rules of the company and made to understand that all increases of wages and advancement are absolutely dependent on her own efforts. Every effort should be made to create as much pride as possible. To this end we must have some definite means to determine who is neglecting her duties and who is giving special attention to her work and I know of no better method than a time test on the service,



that is for each operator to be tested five or ten times every month and a general average taken at the end of each month, the result of this test to be placed on a black-board in the operators' rest room and in order, the best at the top and the poorest at the bottom. This is a roll of honor, but in addition there should be some reward and I suggest that the operator having the best test have two days' vacation, and second best one day with full pay, also that all operators who keep their average test to three seconds or less have an additional \$1.00 on her salary, and as soon as her test goes above that average she should lose the extra pay until her test shows improvement. This applies to all regular operators, and that all promotions and increase of wages for both regular and relief operators be governed by the test, their general deportment and ability, the time of service not considered. This I think will put every operator on her mettle to do the best she can, thereby advancing herself, and the company thus receiving her best efforts. I have used this method with very pleasing results.

Another very important factor in giving good service is to keep in close touch with your subscribers as every telephone exchange has two distinct classes of patrons. One is the subscriber who complains without cause or what is known as a chronic kicker. The other is the subscriber who never complains to the company even though his service is very bad but makes it a habit of telling his neighbors and friends how absolutely worthless his 'phone is. I believe the best remedy and one that will cover all classes is that in addition to the regular morning test that should be made before 10.00 o'clock a. m. every day, there should be a regular quarterly test made, calling every subscriber and inquiring as to the condition of his service and a record made in a book kept for that purpose and if a subscriber complains a list be made and the operator notified. Then that subscriber should be called every day until the service is entirely satisfactory. By keeping this up the worst kickers can be cured and will frequently become one of your "star boarders."

Make your service good and every subscriber is a solicitor for your company. The paramount point we must keep in mind, is that the subscriber must be pleased and to do this it is necessary to render him prompt, polite and attentive service in all departments and to receive all complaints whether real or imaginary as real, and assure him that same will be thoroughly investigated. It is very necessary that under no circumstances should any employe of a telephone company try to argue the question at the time the complaint is filed, especially over the 'phone as the subscriber is usually unstrung and irritated and believes that he is only asking for his just dues. The telephone is different in this respect from almost every other class of business as it furnishes the patron the means by which he is able to get at the proper party and register his complaint at the time when he is most irritable and unreasonable.

About fifty Independent telephone men met in the Business Men's Club Rooms at Waco, Texas, April 26th. This meeting, under the head of what is known as the Texas Independent Telephone Association, was a success in every way, and all those present were enthusiastic regarding the outlook in the state of Texas.

President E. B. Dunaway of Dallas, called the meeting to order and introduced President Hoffman of the club, who welcomed the members, both to the city and to the handsomely appointed rooms in which the session

was held. President Dunaway responded with thanks for the reception and called upon Secretary J. B. Earle for the record of the minutes of the previous meeting, which after the same had been read, were adopted.

President Hoge's letter of greeting and invitation for a state representation to attend the national convention at Chicago, June 26-27-28, was read.

Quite an interesting programme was carried out, the details of which were received too late for publication in June SOUND WAVES.

### Some Who Were Present

The following well known telephone men were present at the ninth annual convention of the Michigan Telephone Association held in Ann Arbor, Mich., March 22-23, 1906:

C. O. Trask, Gen'l Mgr., Peninsular Tel. Co., Detroit; P. A. Peterson, Muskegon, J. M. Gilmer, Ann Arbor; Dr. G. E. Maum, M. D. Mason, L. W. Whited, Ann Arbor; D. R. Maloney, Jackson with Citizens Company; Wm. Cross and D. I. Lawrence, Rankin; Jos. B. Ware, Grand Rapids; H. P. Grove, Grand Rapids, Cedar Poles; J. R. Wiley, Chicago, Standard Underground Cable Co.; C. M. Hamilton, Toledo, Bissell & Co., Toledo; M. S. Walker, Detroit, Bissell & Co.; E. E. Yaxley, Chicago, Monarch Tel. Mfg. Co.; Thos. Bromley, Jr., Muncie, Ind., Indiana Steel and Wire Co.; W. H. Trimm, Chicago, Monarch Telephone Mfg. Co.; A. B. Smith, with Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y.; C. D. Boyd, with North Electric Company, Cleveland, O.; J. C. Kelsey, with Kellogg S. B. Supply Company, Chicago; O. Morseman, Grand Rapids, with Kellogg S. B. & Supply Company, Chicago; E. B. Fisher, Grand Rapids, Sec'y Citizens Telephone Company; C. B. King, Ann Arbor, Gen'l Mgr. Washtenaw Home Telephone Co.; E. J. Stone, Ann Arbor; R. L. Himebaugh, Burr Oak, Sec'y Southern Michigan Telephone Company; Robt. Miller, Muncie, Indiana; Raymond Hendrickson, Cleveland, O.; H. T. Clough, Owosso, Mgr. Owosso Exchange Union Telephone Co.; Jos. J. Wells, Mgr. Citizens Telephone Co.'s exchange, Athens; W. F. Hughes, Mgr. Citizens Telephone Co.'s exchange, Lansing; J. B. Lockwood, Cashier Citizens Telephone Co.'s exchange, Lansing; Charles Challis, South Lyon; C. L. Palee, Mt. Pleasant; Wm. F. Shafer, Ida, Pres't Ida Telephone Company; Wm. P. Strack, Ida, Sec'y Ida Telephone Company; C. E. Ackerman, Lennon, Pres't Lennon Telephone Co.; W. J. Melchers, Gen'l Mgr. Union Telephone Company, Alma; C. W. Swaverly, Kalkaska, Manager Swaverly Telephone Co.; J. Babcock, Pres't, Quincy Telephone Company, Quincy; W. S. Vivian, Grand Rapids, Manager Michigan Traffic Ass'n; N. F. Wing, Grass Lake, Pres't Farmers Telephone Co., Jackson; R. C. Smith, Sec'y Homer Telephone Company, Homer; A. A. Burch, Mgr. Citizens Telephone Co., Battle Creek; V. R. Cummings, Mgr. exchange, Bellevue; J. C. Smith, Mgr. Citizens Telephone Co. exchange, Jackson; W. F. Loepple, Mgr. Citizens Telephone Co. exchange, Zeeland; Jos. P. Badomeur, Mgr. Citizens Telephone Co. exchange, Allegan; D. H. Owen, Mgr. Citizens Telephone Co. exchange, Lowell; F. M. Birchard, Mgr. Citizens Telephone Co. exchange, Lake Odessa; F. W. Gradolph, Dundee, Pres't Monroe County Telo. Co.; Seth C. Dixon, Dundee, Vive president Monroe County Telo Co.; F. M. Howard, Flint, Auditor, Saginaw Valley Tel. Co., Saginaw; H. A. Price, Bay City, Gen'l Mgr. Saginaw Valley Tel. Co., Saginaw; W. N. Taylor, Marshall, Mgr. Citizens Exchange; W. O. Hunt, Adrian, Secretary Adrain Telephone Co.; T. M. Sloan, Mgr. Diamond Exchange, Citizens Telo Co.; F. V. Newnman, Mgr. Grand Rapids exchange, Citizens Telephone Co.; C. E. Tarte, Gen'l Mgr. Citizens Telo. Co., Grand Rapids; Geo. C. Britton, Cashier Citizens Telo. Co., Grand Rapids; Mason Reynolds, Mgr. Mason Exchange, Citizens Telo. Co.; Wm. Robinson, Mgr. Citizens Telo. Co., Muskegon; M. A. Porter, Mgr. Northville Telo. Co., Northville; C. H. Rouch, Sec. and Mgr. Plymouth Telo. Co. of Plymouth; G. S. Stout, Lake City, Pres't Missaukee Telo Co.; W. A. Young, Benzonia, Pres't Benzie County Telo Co.; D. G. Kennedy, Pres't Grand Ledge Telo. Co.; Clark Smith, Sec'y Grand Ledge Telo. Co.; C. S. Bartlett, Pontica, Director Oakland County Telo. Co.; I. R. Close, Pontica, Director Oakland County Telo. Co.; Max Koehltr, St. Louis, Mo., Home Telo. Co.; Detroit; W. B. Woodbury, Gen'l Mgr. Home Telephone Co. of Detroit; R. B. McPherson, Pres't Livingston Home Telo. Co., Howell; A. B. Fishback, Mgr. Livingston Home Telo. Co., Howell; J. M. Fuller, Grass Lake, Sec'y Farmers Telo Co., Jackson; J. H. Fildew, St. Johns, Sec'y Union Telo. Co., Alma.

# Telephone Talks with Telephone Men

P. KERR HIGGINS, A. M. I. E. E.

Magnetos consists of three parts, (1) The Generator. (2) The Ringer. (3) The Hook Switch. The generator may be either series or of the bridging type; in the former the object is to get high pressure and small quantity, whereas in the bridging we need large quantity with only enough pressure to ring all the bells on the line. This will be seen in Fig. 1, showing four instruments in series;

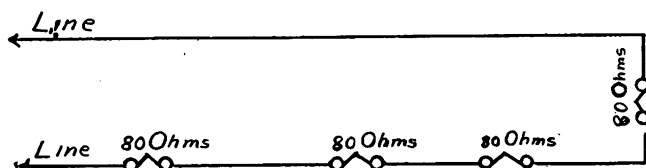


FIGURE 1, SHOWING FOUR-PARTY LINE.

as all the current has to pass through these bells, pressure is required. Now look at Fig. 2, four instruments bridged; the current approaching instrument number one, some of the current is lost in ringing that station and passing over to the other side of the line back to genera-

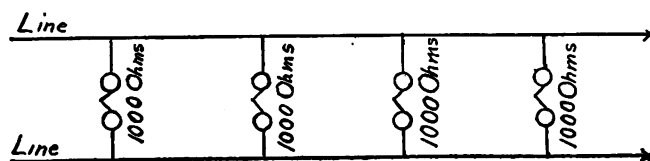


FIGURE 2, SHOWING FOUR-PARTY LINE.

tor; at the second, third and fourth some is lost and so while the pressure required is not so great we require more current. In other words, in the bridging, current is lost at each station; in the series a drop in pressure takes place on account of the accumulated resistance in series. In practice to-day, the series generator is seldom used on party lines and only on main lines because they are cheaper. If fifty volts were necessary to ring one station on a series line, then 4x5 (20 volts) would be required to ring four stations without any allowance for the resistance of the lines connecting the stations; hence series generators are very often wound (for party line work) to a high voltage (about 90 volts, output 10 watts). The series generator is cheaper to manufacture than the bridging and proves useful on poorly constructed lines. For series work a five bar, 50,000 ohm, armature 550 ohms of No. 35 wire is good. In the design of such generators, when quantity is required, the resistance of the armature is reduced, the frame larger and the magnets longer and more powerful. A good bridging generator is a 500,000 ohm 5 bar of No. 33 wire wound to 350 ohms, (20 to 25 watts.) In finding out the work which can be done by a generator, the use of Ohms law is necessary, which abbreviated is as follows:

$$C = \frac{E}{R}, R = \frac{E}{C} \text{ and } E = C \times R. \text{ Take any example, } E = 100. R = 250, \text{ then } C = \frac{E}{R} = \frac{100}{250} = 4 \text{ amp. Which divided by } 4 \text{ to allow for re-actance in the armature .1 amp.}$$

Then to know how many instruments such a current

will ring, we must know how many milli-amperes it will take to ring those bells, which can also be found by using the rule above quoted; allowance must also be made for the resistance of the line and should be added to that of the ringers. There is also reaction or retardation in the ringer coils, capacity and low insulation on the line, etc., so that while a generator in the factory on a model line may ring twenty stations, it does not mean that this can be repeated on the average line; in practical use an allowance being usually made of 33 1-3 per cent. less than factory results. To increase the current output of a generator, we must either increase the number of ampere turns or decrease the resistance of the armature. In the construction of a generator there are the following parts:— (1) Magnets. (2) Armature. (3) Containing case for armature. (4) Gear. The magnets may be three, four or five, according to the strength and purpose for which the generator is required, and should be powerful, horseshoe in shape, so as to concentrate the lines of force on the armature space; at the ends they are united by soft iron pole pieces so arranged as to form a magnetic chamber in which the armature may revolve freely but not leaving too much air gap between the armature and the pole pieces; the north and south pole pieces are separated from each other by an air space or dead point both above and below so that no contact exists between the pole pieces. The pole pieces are held together by non-magnetic ends so arranged as to form a support for the armature, the spindle of which extends through the said end pieces; the form and construction of the generator is familiar to most, if not all, telephone men and so we will give the design or make-up of the armature most attention. The armature is of the Siemens type wound with fine silk insulated copper wire, one end being connected to an insulated pin on the side of the generator opposite to the gear and the other end of the wire to the body of the generator. The number of turns (ampere turns) and the resistance of the armature is dependent upon the purpose for which the generator is required. Turning the armature in the enclosed magnetic field induces in the wire a current, which passes out at the insulated point and the frame of the generator. In order to concentrate the lines of force from the magnets so that the maximum number may be cut by the armature in revolving, the armature must fit the chamber as closely as possible, a play or air gap of .2M.M. only being allowed. It will be noted that the armature passes both poles of the magnets, hence the current in process of generation will be alternating in character, being inductively affected by the change in magnetism in the two poles of the armature. The form of the current wave is determined by the size of the armature pole arms, that is, the metal arms, the armature being shaped as in Fig. 3. It will be noted that as the armature poles pass the magnets there is a neutral point where the current changes from positive to negative and is shown in Fig. 4, at right angles to this is the point of maximum induced current. If the pole arms of the armature do not completely fill the air gaps between the magnet pole pieces, then the wave motion will be more abrupt. The motion is an alternation from a north to a south pole for each complete revolution, so that there is four changes in polarity for each complete revolution. The induced current in the armature is pro-

portional to this change in magnetism. Now, if the armature poles overlap, then the contrary effect is observed. This arrangement prevents them losing their magnetism and so the change is so gradual as not to be easily observed. The quantity of the current will be approximately the same in both cases but the wave less abrupt. The best results are obtained, for all purposes, when the armature pole pieces exactly fill the air gaps. The magnet and the armature pole pieces should be of the same size. The wave length and formation would not be of consequence except for its inductive effect on neighboring lines. The customary resistance of armatures is about 500 ohms and 4000 ampere turns, which at a speed of six revolutions per second will produce 75 volts. The field of the generator

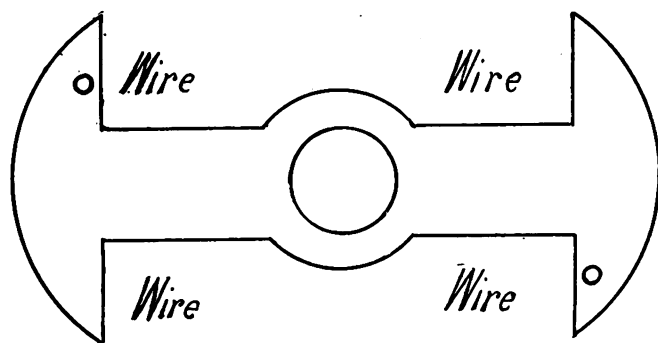


FIGURE 3, SHAPE OF ARMATURE.

should be made out of a solid, substantial casting of soft iron, accurately seamed out to conform to the curvature of the armature; the armature should be built up of laminated iron, carefully assembled on a steel shaft, with the very best rubber or fiber insulation between points to be insulated. The permanent magnets should be made of special steel, carefully selected and tested with a view to holding magnetism indefinitely. This test should consist of requiring all the magnets to lift an iron bar, five times its weight, before being placed in the generator. The magnets should be fastened to the frame by means of iron bolts entering projections in the field casting, which avoids binding of the armature. The gear should be finely cut and have a wide face and be practically noiseless when in use; the speed of the armature should be as nearly uniform as possible in passing through the field. A shunt should be provided (preferably outside of the armature) to cut out the armature coil when not in use and should be automatic, being brought into play by the gear in motion. The idea of a shunt may be either a complete cut out or shunt it out by bridging, as is usually done; this bridge is of practically no resistance and so cuts out the high resistance of the armature coil. Series generators are generally wound to 500 ohms, using a No. 34 wire having 4500 ampere turns; a bridging generator 275 to 300 ohms No. 32 wire and 4000 ampere turns. It is scarcely necessary to say that all similar poles of magnets should be together. In some of the later generators the fact, that positive and negative currents are generated in an armature, is taken advantage of and used for selective signalling with bells correspondingly polarized, so as to have a selective system. The bells are biased so as to respond to a positive or negative current as arranged; this will be ex-

plained under ringers. The manner of arranging this in the generator is to split the collector so that only one-half of the generator current is used, if positive is desired then that is used; if negative, then the negative; and if alternating, a combination of both, this is shown in Fig 5. One-half of the collector is metal and the other rubber,

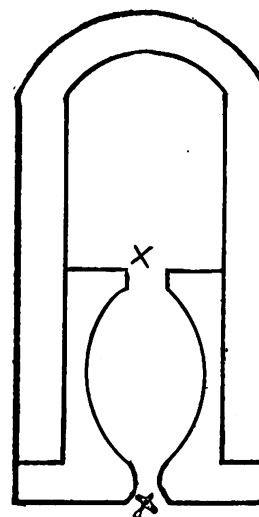


FIGURE 4, SHOWING NEUTRAL POINT AT X.

the spring is split so as to make contact with one or both as desired; if the whole spring is used the complete alternating current is obtained. As in the case of magnets, the center of an armature possesses very few lines of force and this accounts for its peculiar shape. The troubles usually occurring in a generator are: (1) Open. (2) Short. (3) Weak Magnets. The method of location is usually by means of the fingers or the use of a battery and buzzer. A polarized ringer is necessary for receiving the sent currents of the generator and may now

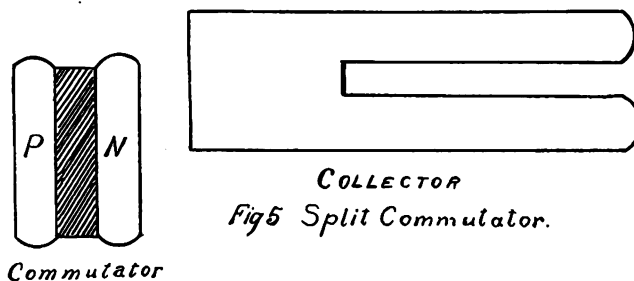


Fig 5 Split Commutator.

be considered. Generators are often rated according to resistance, e. g. 50,000 ohms, which means that they ring their own bells through this resistance.

#### RINGERS.

The current from the generator being an alternating one, the bell operated by it must have a polarized armature, the best and most satisfactory results being obtained by the use of both the positive and negative currents. Ringers should be constructed with a view to (1) Sensitiveness. (2) Power of stroke. The apparatus usually consists of two electro-magnets, an armature, a polarized magnet, a hammer or striker and two gongs. The electro-magnets are so arranged as to resemble a horse-shoe, having two ends bound together with a strip of iron, the whole is mounted on a non-magnetic metal frame, and is usually made up in a large variety of forms. As it is

apparent that (due to residual magnetism in the coils) the armature may adhere to the cores or pole pieces, it is customary to insert a non-magnetic rivet either in the center of each pole piece or in the armature directly in front of the pole pieces, or a thin copper strip may be placed between each pole piece and the armature.

To accomplish sensitiveness, the hammer should be short and arranged between the gongs and the coils; to obtain loud powerful stroke, a long hammer is used and the armature arranged back of the electro-magnet, the hammer being then parallel to the coils; in the latter form more power is necessary but having a longer sweep will strike with much more power force than in the short stroke, which responds to a weaker current; the gongs should be made out of bell metal not too thick. To give a variety of tones, so that bells in the same room may be distinguished one from the other, saw-cuts may be made one-quarter or a half inch deep on the edges of the bells—one or more, according to the tone desired. The vital element in a polarized bell is its polarizing magnet which, if weak, will frequently reduce the power of the bell seventy-five per cent.; hence the polarization of the armature, by means of the polarizing magnet, is absolutely necessary to the efficient working of the bell. It is known that the cores are magnetized only while the current is passing through the coils, hence the magnetization of the cores produced by the passage of the current through the coils or the force actuating the armature, is proportional to the permanent magnetization of the armature and that produced by the current in passing, but independent of the cores. The magnetism of the armature should be as strong as possible without interfering with the magnetizing of the cores by the alternating current; for this reason some manufacturers prefer not to attach one end of the permanent magnet to the cores, but place it about one-eighth of an inch from it. The coils may be wound, to any resistance desired, of fine insulated wire, usually 80 ohms for series and from 1000 to 2500 ohms for special party line work. The number of ampere turns is also important and is seldom less than 2500; the cores should be of very soft iron and vary in length as do the spools according to the winding of same. The relation between the resistance of the ringer and the drop or annunciator at central should be about the same so as to get the best results, and the best results for both in main line work is 500 ohms each, for ordinary party line work 1000 ohms, and long special party lines from 1600 to 2500; but in such cases it is not necessary to wind the central office drops higher than 1000 ohms, which is considered the limit. Ringers used on party lines should have long spools with many ampere turns and high retardation; this is necessary to prevent the voice currents in talking from breaking through the ringers to the other side of the line and being thus weakened, retardation has a tendency to hold back the voice currents. It is apparent that the ringer is the all-important part of the magneto, for if it does not work, the whole instrument is of no use whatever, even if the generator worked we would not know it, hence its construction should be of the highest possible efficiency with the minimum possibility of trouble. Poor iron, in the cores armature of strap, will cause retention of magnetism and consequently trouble; hence the very best Norway or Swedish iron should be used, carefully annealed. The use of soft steel, while cheaper, reduces the efficiency.

#### BIASED RINGERS.

These are used for selective ringing on party lines and are made up in many forms, the principle in all being

more or less the same. The object is to polarize or bias one side of the ringer by means of a copper spring or a steel spiral spring; this holds the armature normally against one side of the ringer spools, the impulses being all in one direction will (if in the proper direction) have a tendency to hold the armature more tightly against the core, while if the wires are reversed will have a tendency to pull down the other side of the armature; strike the gong and the spring pulling the armature between the pulsations gives the desired and necessary alternate movement of the hammer and produces the signal. Now, if we place two of such ringers on a line and so arrange them that they are oppositely affected (that is, one responds to a negative and one to a positive current) we may send out a positive current from central and only the positive bell will respond and we may also send out a negative current and only the negative will respond. By sending out an alternating current both bells are rung. In such selective ringers, as already explained, it is desirable to have long spools and high winding. An occasional adjustment in the ringers on such selective ringing is necessary. By a fine adjustment the bells may be so arranged that they will not respond to an alternating current. If we look at the diagram we will see how the ac-

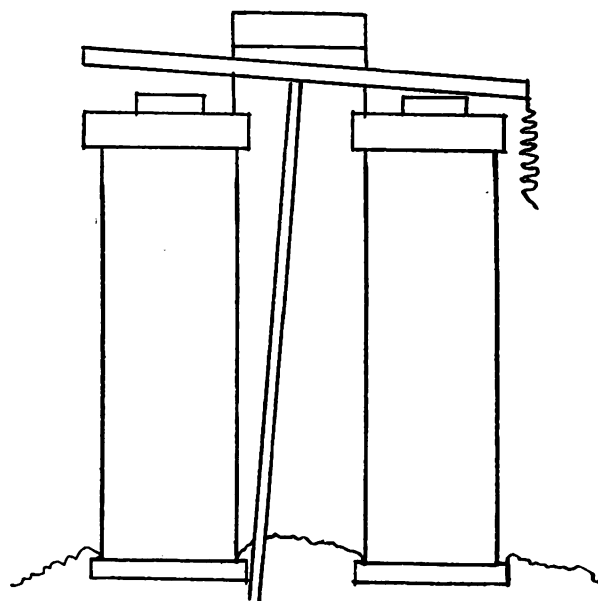


FIGURE 6. POLARIZED RINGER.

tion takes place in a ringer. The cores being in the magnetic field of the permanent magnet through the intermediary of the armature by induction assumes an opposite polarity to that of the permanent magnet; now when the pulsations of the current from the generator pass through the windings of the coils, the magnetism of one of the poles is increased and so the winding being in the opposite direction on the other spool the other pole will be affected in an opposite manner, the pulsations being alternately positive and negative and the wave being in an opposite direction to the other the armature is alternately moved from one pole to the other and the hammer, being a part of and attached to the armature, partakes of its movements and a side-to-side motion takes place, which strikes the hammer against the gongs first one side and then the other. This action would be very weak (as explained) if not controlled and assisted by the permanent magnet. The voltage necessary to operate polarized bells is from 75 to 100,



according to their sensitiveness and the arrangement of the windings. The polarized bell is preferred to a direct current bell, because on the former no contacts are necessary as in the latter and because it is less liable to trouble and has practically no consumption of material, as is necessary in battery signalling. In the making of magnets, steel, containing a small proportion of sulphur and phosphorous and high proportion of carbon and manganese, is very good, and such are best hardened by being heated to a bright cherry red and dipped in mercury or brine; the heating should be done as quickly as possible and not over-done. Magnetising or re-magnetising of magnets is done by drawing them several times over a powerful electro-magnet with large pole pieces, the drawing movement being done in the same direction each time. The law which explains the theory of operation of the ringer is the old and familiar one, "Like poles repel, unlike poles attract each other," and a study of this will greatly help in understanding the action taking place in the ringer before and after the current has passed through the coils. In the construction of the coils for party line work, it is well to remember that it is the number of ampere turns, more than resistance, that is required; hence the necessity for long spools. A good test for a magneto is to ring it on a dead short circuit, then cut in resistance and observe if there is any hesitancy in the response of the striker; there should not be, if the resistance cut in is what is claimed by the manufacturer. The following will give some idea as to the relative windings for different work. For series 80 ohms No. 30 B. & S. wire 4600 turns; bridging 1000 ohms No. 36 B. & S. wire 12,980 turns and others in proportion. It must be remembered that while the measured resistance of coils may be a given amount, the retarding effect makes its actual resistance to the direct current many times higher, due to the counter E. M. F. set up by the opposing current which is nearly as strong as the original. The question frequently arises as to the combination of bells of different resistance, e. g., in the case of an extension bell of say 80 ohms in series with one of say 1600 ohms, and an explanation of this will explain similar problems. In this case the 1600 ringer gets 1600—1680 of the pressure or voltage of the generator and the 1600 ohm bell will ring all right but the 80 ohm bell will not respond, because the 80 ohm bell, having less ampere turns, is less sensitive and receives only 80—1680 of the voltage generated, which is extremely small. By applying such a rule an idea can be had of the best combinations to make, although in practice I have found the rule faulty because of varying conditions, such as adjustment, etc., hence the best and surest way is to connect them up in the office and try them before sending them out.

#### THE HOOK SWITCH.

This switch, with the necessary wiring, completes what is known as the magneto and performs a two-fold purpose, acts as a receptacle and holder for the receiver and an automatic means for cutting in and out or changing from a position of receiving a call to that of answering a call. In other words the sub-station set is at once a two-fold instrument, receiving and sending or signalling and talking, hence some mechanical means must be provided for transforming from one to the other. It is true these might all be connected together in series, but such an arrangement possesses many objections; for example, the increase in resistance, the retardation of the ringer and armature, which would materially effect the talking efficiency, etc. To avoid all these the hook switch is used

and made up in a large variety of forms but for the same purpose. This hook switch, in the normal condition, leaves the signalling apparatus in circuit and the talking and listening circuit cut out. It usually consists of a long lever, extending beyond the box of the magneto with the holder arrangement for the receiver; inside the box it is pivoted to a fixture, and so arranged that in its normal position it is resting against the pressure of a spring and held down by the weight of the receiver, so that when the receiver is taken off the hook, the hook flies up. Two methods of cutting out are in common practice:—(1) Cutting out entirely. (2) Shunting out. The act of taking down the receiver allows the hook to fly up and in so doing the lever contacts come into contact with the talking springs and cut in the talking circuit which heretofore had been open (to save the loss in battery current) thus the automatic switch opens and closes the primary circuit of the instrument in response to the act of hanging up or taking down the receiver; that is in a magneto system. In a central energy system the conditions are different, but we are now considering the magneto only. To get the best results the spring contacts should all be located at the opposite end of the hook from the receiver holder, so as to obtain the maximum force of contact between points. All contacts should be platinum, certain in movement, spring style, and rubbing in their movements, so as to clear away any accumulated dust particles account of non-use. As the hook switch performs a very important function in the working of the instrument, it is important that it should be well and substantially built.

#### WIRING.

In the wiring of the instrument, if insulated wire is not used, grooves should be made and the wire run in the grooves, all the wiring being done on the back of the magneto when possible, any wiring inside should be properly insulated. All connections between wire and contact points should be well soldered, being careful not to use acid and to avoid what is known as "resin joints," to this end the solder must be sweated in so that the two parts virtually become one. The hinge contacts should be reinforced spring so that when the door is closed the spring with a rubbing movement presses against and makes good contact between both sides of the hinge.

Mr. Chas. E. Egan was in Chicago recently in the interest of the Egan Electric Massage Vibratory Co., of which he is president. This company was incorporated in March for \$30,000, with the following officers: C. E. Egan, president; T. W. McNeely, secretary; John S. Huric, treasurer. From the present indications, their massage machine will meet with a very heavy demand, as they are able to put it on the market at \$15.00, which is considerably less than any other efficient electric massage machine now before the public. Mr. Egan is well known in the telephone field, his latest work being with the Egan Electric & Telephone Mfg. Co., Petersburg, Ill., of which he is also president.

The H. B. Camp Co., handling vitrified clay conduits, are now located in the Flat Iron Bldg., Broadway, Fifth Ave., and 23d St., New York, having removed from 170 Broadway about May 1st.

# Some Ideas of Telephone Currents

G. W. WILDER, PH. D.

For direct use an alternating current is usually produced by a machine as stated above, however, there is an interesting relation between the direct current and the alternating by which the latter is often produced by the former. This is especially true in telephone work where use is made of induction coils and may be explained in the following manner: A current flowing in a wire produces a magnetic field around the conductor which is represented by lines of force drawn in the form of circles. The circles may be traced out by placing a little compass needle at various points about the wire, as in Figure 11, noting the direction it points at these positions and then drawing a curve which marks out the general direction of the magnetic force. It is found that when the current

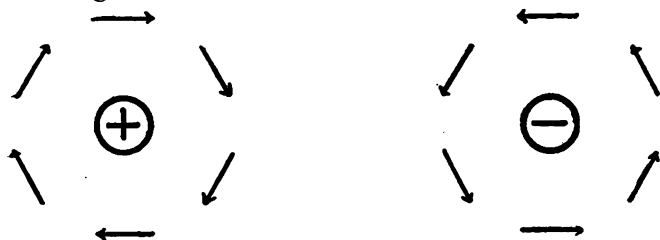


Fig. 11.

COMPASS NEEDLE PLACED NEAR A WIRE.

flows in a direction from the reader towards the plane of the paper these lines will have a clock-wise direction as shown in Fig. 12. The intensity of the field thus produced may be represented by the number of lines drawn in any instance. The field extends to an infinite distance from the conductor theoretically, but practically it extends to only such a distance as can actually be detected by a needle or some measuring instrument.

When a current of definite strength passes through a conductor a field of corresponding strength is built up

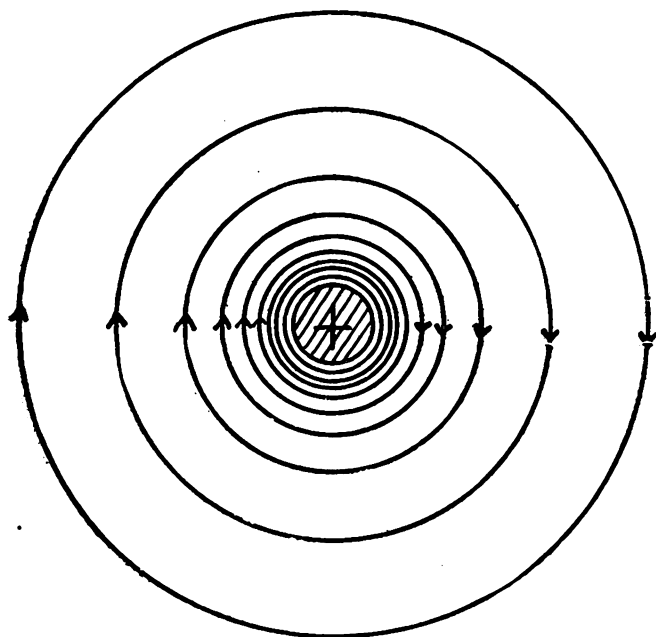


Fig. 12. Magnetic Field About a Wire.

about it, increasing from zero to its full value from the time the current is turned on until it is fully built up. We

do not imagine this to happen instantly, but regard the process as taking some little time depending upon the nature of the circuit and several other things. A good way to handle problems of this nature is to imagine the lines of force to emanate from the conductor itself as the current is turned on. We think of the lines as traveling out from the conductor, becoming larger in diameter as they proceed, just like ripples on the surface of a millpond when a stone is dropped in the water. When the current reaches its maximum value the lines stop their progress outwards and become fixed in their positions. When the current is broken, all of the lines must come back to the conductor and disappear in the reverse order. This process of the building up of the magnetic field about the conductor helps us to explain many interesting things regarding magnetic phenomena as related to electric currents. Suppose several conductors are placed parallel to each other and a current is passed through the first one as shown in Fig. 13, then lines of force will travel out from this conductor as the current is turned on and as they travel out they will come across the other conductors and cut across them in succession.

If in cutting across these conductors we imagine a tendency for the lines to wrap themselves about them, as shown in Fig. 14, we can see that a current will be gen-

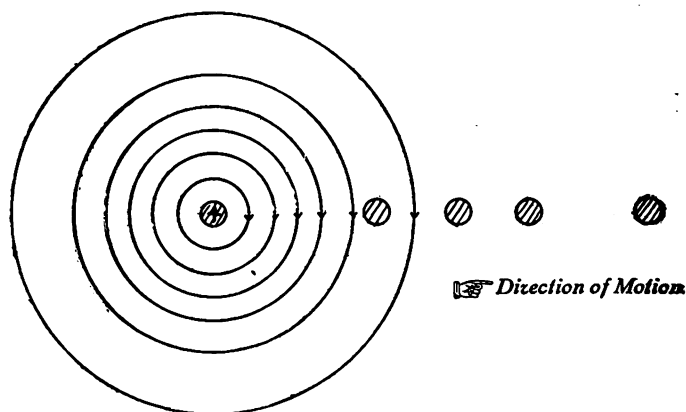


Fig. 13. Showing Motion of the Field as Current Increases.

erated in each of these conductors, for they will then be surrounded by lines of force and that means currents must exist. Now there are several things to be noticed in connection with these currents. First of all, they will exist only while the lines are moving outwards. Second, they will be in a direction opposite to the current flowing in the first conductor according to the rule showing the relation between a current and the magnetic field surrounding a conductor. Third, the conductors farthest away will be cut by a less number of lines than those nearest the first conductor, for the former are in a weaker field or are at such a distance that all of the lines do not get so far. Consequently the currents induced in these conductors are not as strong as those induced in the others.

When the current in the first conductor becomes constant in value the lines remain in a fixed position and no longer cut across the other conductors, hence they no longer wrap themselves about these conductors and cause currents to flow through them. The currents last only during the time that the lines are moving outwards and

their values will depend upon how fast the lines are moving; for, the faster the motion of the lines are the greater the number that are wrapping themselves around any conductor at any instant. Since the motion of the lines is due to the increase of the current in the first conductor, we may say that the induced currents last only while the current in the first conductor is increasing and that just as soon as this current reaches a steady value then the induced currents die out completely.

When the current in the first conductor is decreased, the lines all come back again and in doing so they cut the

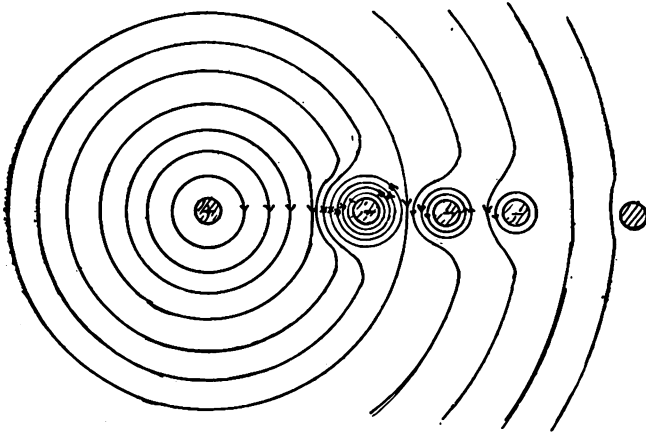


Fig. 14. Showing how Currents are Induced in Neighboring Conductors.

other conductors in the opposite direction, as shown in Fig. 15. In this case they wrap themselves about the conductors in a direction opposite to that in the first place and as a consequence they induce currents in these conductors in the reverse direction or in a direction which is the same as that of the current in the first conductor. As a result we see that when a current is turned on in a conductor and then turned off again currents are produced in all neighboring conductors which flow in one way for one instant and then flow in the other. When a circuit is made and broken with regularity these induced currents will surge backwards and forwards or will be alternating.

An interrupted current will produce an alternating current in all neighboring circuits. This is made use of in telephone work by using the induction coil, which consists of a conductor wound several times around an iron core and which represents the first conductor in the above dis-

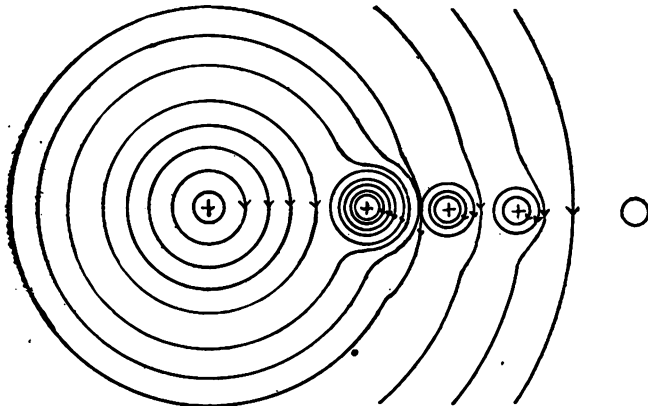


Fig. 15. Showing Induced Currents when Field Recedes.

cussion, together with another conductor wound around the same core close to the first one, representing the other conductors. The first conductor is placed in circuit with

the transmitter and a battery and is known as the primary circuit, while the latter conductor is placed on the line with the receiver and is known as the secondary circuit. Although we have spoken of the current in the primary circuit as being broken in the above case, it will be seen that this is not necessary in order to produce an alternating current in the secondary, for the currents in the latter circuit are caused by a change in the intensity of the primary current no matter whether this change is such as to completely break the current or not. Consequently it will be seen that the transmitter which causes the battery current to vary, will produce alternations in the secondary which will actuate the receiver placed in that circuit.

When a steady flowing direct current passes through a circuit its value is constant and depends only upon the electromotive force used and the resistance of the conductor. This is not true, however, in the case of an alternating current, for here the magnetizing effect of the current must be taken into account. This will depend upon how fast the current changes in direction or the frequency as it is called, and also upon the arrangement of the circuit; that is, whether there are many turns of wire about iron cores which set up strong magnetic fields when energized. Suppose we have a circuit in which the current takes some little time to reach its maximum value after being turned on and after closing the key we break the circuit before the current has time to reach its full value. By doing this constantly we may produce an interrupted current as small as we choose by making the time interval short enough. An alternating current will behave in the same way and may be made very small by taking short intervals between the reverseals as shown in Fig. 16. A circuit, then, offers an extra impeding effect to an alternating current in addition to its ordinary resistance. The two quantities combined are known as the impedance of the circuit. The

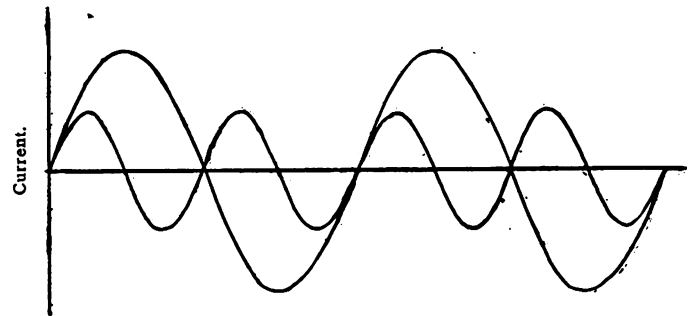


Fig. 16. Effect of Frequency on a Current.

part due to the magnetism which is induced about the circuit is known as the inductance and depends upon the frequency and the configuration of the circuit. Coils of wire wound around bundles of soft iron give considerable magnetic effect and hence have a large impedance. Such coils, when specially built for retarding the current, are called impedance coils, also retardation coils. When these are inserted in the path of an alternating current the latter is cut down in intensity and often to such an extent that no current is left. This is especially true when the currents have a very high frequency, as telephonic currents for instance.

It is often desired in telephone work to allow a battery current to pass through a certain portion of a circuit but to shut out all telephonic currents or those due to the voice talking into the transmitter. In such cases an impedance coil is inserted in the circuit, thus allowing the battery current to pass without any hinderance but being impervious to the other currents. Since the impeding effect of a

coil depends upon the quantity and quality of the iron core as well as the number of turns of wire, it is evident that coils may be designed to completely cut out a current of almost any frequency. Sometimes, however, it is desired to shut off currents of one frequency and allow those of another frequency to pass. This can be done and is often done when the two frequencies are widely separated as in ringing and talking. A ringing current has a frequency of about sixteen cycles per second, while the voice currents have an average of about six hundred cycles per second, consequently a coil may be constructed which will have impedance enough to shut out the telephone currents but not enough to prevent ringing through it.

(To be Continued.)

## Interior Telephone Systems

CHAS. H. COAR.

The circuit arrangement of some interior systems make it necessary for the stations to resume a normal after each call, that is, saying the switch lever or plugs, which ever may be used, have to be returned to the "home contact" in order to receive incoming calls properly.

While the station arrangement shown in Figs. 1 and 2 of article in the May number of SOUND WAVES do not require that this be done absolutely, in that the bell circuits are connected to the lines proper, the later systems have been designed in view of obviating any trouble arising from this source by a mechanical arrangement of some sort which automatically returns the switching appliances to the "home station" when the receiver is in place. One of the earlier systems to utilize a device of this kind was invented by Mr. T. W. Ness, which is shown in Fig. 3.

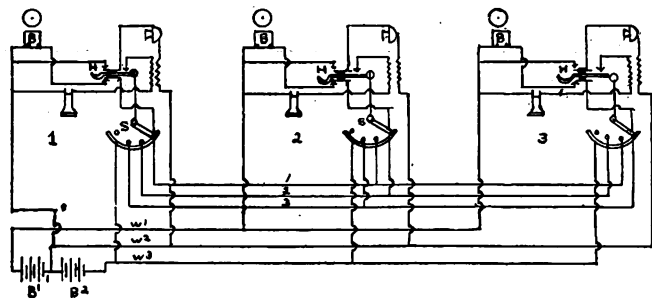


Fig. 3.

The feature of this system is the automatic switch shown in Fig. 4, which automatically restores the switch to its proper position by replacing the receiver in the hook. This arrangement has the station switch lever operate under the tension of a coiled spring in such a manner that it has a tendency to return to the normal position upon its release from any other contact upon which it may have been placed. A little description of Fig 4, which is a view of the mechanism, will possibly tend to make this clearer. Referring back to Fig. 3, the switch lever S, as shown at each station becomes a part of Fig 4, and is fastened to the shaft carrying the ratchet wheel D, both being mounted together are under tension from a spring coiled about the shaft as shown.

At such times as the station lever S is moved, the ratchet wheel R revolves and is held in a position corresponding to the one at which the switch lever stops, by the sliding pawl P, which is normally pressed down on

It is hard to illustrate the effect of impedance upon a circuit by means of our water analogy as given in previous numbers of SOUND WAVES, however an incomplete conception may be had by imagining a narrow stick to be placed across the canal just at the water line. Now as the water flows around the canal it all passes beneath the stick and the latter does not in any way interfere with the flow. When waves are sent out over the flowing stream they meet the board, are broken up by it and destroyed altogether, the water emanating from beneath the board in a smooth, quiet way, representing the flow of the direct current minus all of the undulations produced by the transmitter.

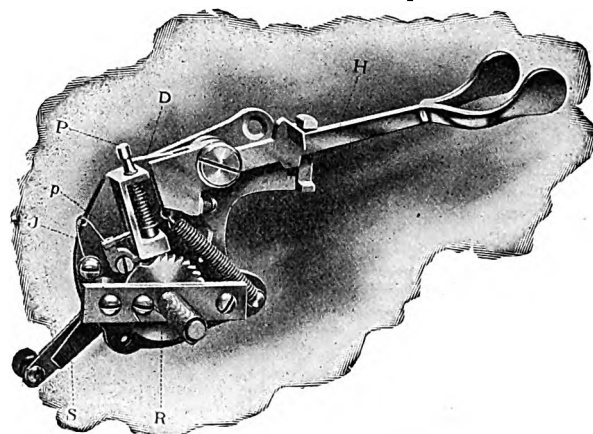


Fig. 4.

switch lever is about to resume the normal position, a pin in the ratchet wheel R forces the dog P out of engagement with the pawl P, releasing same for further operation. In addition to this operation the switch hook H is utilized to connect the talking apparatus into the circuit properly by means of contacts not shown.

The circuit arrangement of this system is shown in Fig. 3, where it will be seen that the telephones receive their battery supply from two separate batteries, one of which is utilized for talking purposes. In the circuit three stations are shown, all of which have similar taps taken from the battery wires, W1-W2 and W3. The wire W1 extends throughout the system and is used as a common return for the ringing and talking currents. the wire W2 is used to supply battery B1 to the transmitter circuits and the wire W3 supplies battery for ringing purposes. Each telephone is equipped with an induction coil, the primary winding being in series with the transmitter and switch hook contacts H, in such manner that the different transmitter circuits are fed in multiple from the battery B1 by the wires W1 and W2 during conversation.



The secondary winding of the induction coils is arranged in series with receiver in such manner that it is switched to the various station lines by means of the switch S, as will be explained.

A low wound vibrating bell is used for the station signals. The station lines 1, 2 and 3 terminate in switch contacts at each telephone as shown at S, where they are so associated with the ringing segment, also shown, that the following operation is possible. The switch lever S, is constructed with two tongues, both being in electrical contact, but mounted one above the other from the same rotating pinion and separated from each other throughout their length. The lower and shortest tongue makes contact with the various station contacts or terminals, while the longer and upper tongue slides over the ringing segment without coming in contact with it normally. However, when this spring or tongue is pressed it comes in contact with the ringing segment and thus connects the ringing battery B<sub>2</sub> to the line the station switch or lower tongue is in contact with. This operation causes the desired station's bell to ring. Assuming that station 1 called station 3, and that the receivers were off at both stations, conversation would be accomplished in the following manner: The transmitters and primary winding of the induction coils at these stations would then be arranged in series with the battery wire W<sub>1</sub> and common return W<sub>2</sub>, by means of the switch hook contacts H, at each station in such manner that the two connected telephones would be operated in multiple in so far as their battery supply is concerned. One secondary terminal of each induction coil is connected through the receiver to the common return wire W<sub>2</sub>, while the other secondary terminal of each coil is arranged to be connected by means of a contact at the switch hook H, to the levers

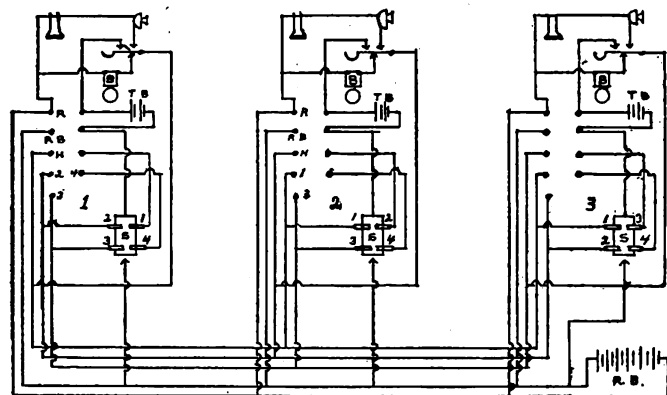


Fig. 6.

of the station switch S. In this instance both switch levers would be in contact with station 3, thus placing the secondary circuit of these stations in series with each other.

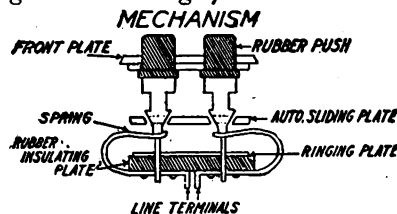
Therefore in this system when the two stations are connected, the transmitter circuits receive their battery supply in multiple while the receiver circuits are placed in series. The replacing of a receiver to the switch hook releases the switch mechanism and allows the switch levers to resume the "home position," as explained before. The induction coil of this system has a primary winding of  $\frac{1}{2}$  ohms resistance.

The voltages of the batteries B<sub>1</sub> and B<sub>2</sub> vary as the distance covered by the system. Common return systems supplied with centralized batteries are very susceptible to cross talk when the battery conductors have any ap-

preciable resistance, therefore it is consistent to keep the resistance of the common return low as possible, the same holds true for the other battery conductors.

The circuits shown in Fig. 6, illustrate one arrangement for interior systems known as the De Veau, and differs from the other systems described in the fact that local batteries are installed at each telephone for talking purposes, and that no induction coils are used.

A centralized ringing battery, R B, is used for ringing the station bells which are ordinary vibrating bells. A common return wire R, is used for both ringing and talking purposes, a wire R B, transmits ringing battery to the switches S, in addition to the individual stations or line wires of the system. This system is supplied with an automatic switching arrangement; a section view of the switch being shown in Fig. 7.



The different station lines of the system are connected by suitable means to the line terminals which are metal springs bent in the shape shown. These springs are mounted on a hard rubber block.

The springs mentioned have a hole drilled through their free end through which the plungers of the station buttons pass. Each plunger of the station buttons are equipped with two collars, one of which holds the line springs in a normal position, the other being so arranged as to engage the automatic sliding plate when it has been pressed through the opening provided in this plate. The sliding plate is held in a certain position by a spring which normally tends to prevent a plunger which has been pressed in sufficiently far, from returning to its natural

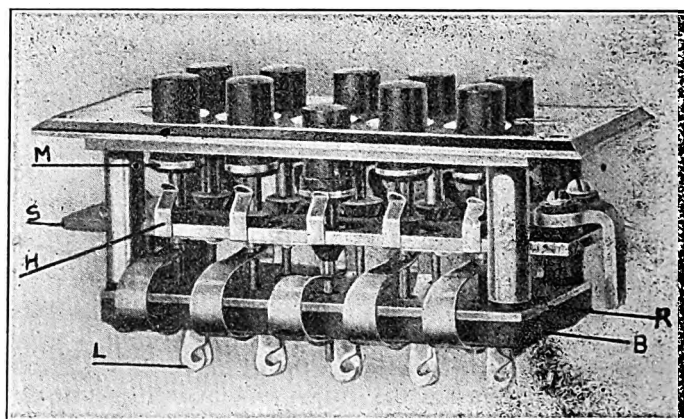


Fig. 8.

position. Thus when a button is pressed in it is held in contact until released by aid of some other button, which would displace the sliding plate and allow the free button to return to normal. When a button is pressed in it causes a metallic connection to be made between the upper metal collar on this button and the sliding plate, which operation connects the line under operation to the local telephone talking apparatus. In calling the station the buttons are pressed in sufficiently far, to bring the line springs in contact with a metallic plate mounted on the upper side of the rubber block. This plate is connected with the ringing battery and allows the current to pass

out over the line by means of the spring held in contact with it and thus operate the station bell. Release the button from the ringing position and it will return to the position where it is held by the sliding plate, which as before mentioned would place the telephone apparatus in talking connection. The sliding plate is in some instruments of this type, so arranged in conjunction with the receiver hook that when the receiver is replaced it oper-



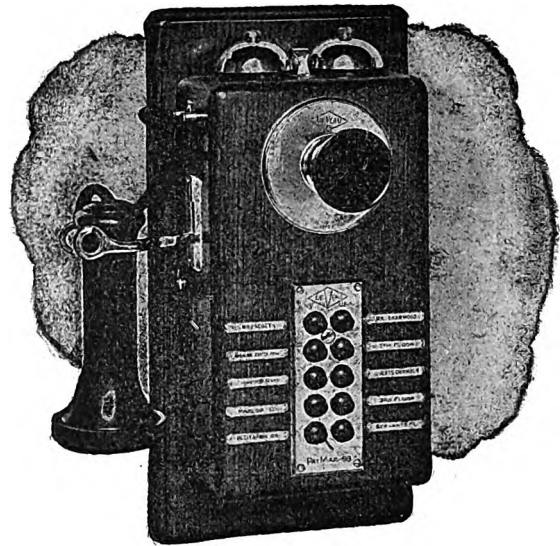
*One Type of the Ness System.*

ates the sliding plate and thus restores any station buttons which may be pressed in. It will be understood that the pressing on one button will release any other buttons which may be locked by the sliding plate cam. A view of an assembled switch is shown in Fig. 8, where it will be noticed that one button is pressed into contact.

In Fig. 8, the contacts M, make the metallic connection between the sliding plate S, by means of the springs H. This sliding plate is connected to the talking battery as shown in Fig. 4. The line springs are shown at L, the

ringing plate at R, and the hard rubber mounting block at B. In this circuit the calling station furnishes battery for talking purposes, the transmitters and receivers of stations connected operate in series, as will be evident by referring to Fig. 4.

In a system of this kind there is very little liability of cross talk, if the station lines are not too long, for the tele-



phones are supplied with individual talking batteries. It is proper to install the batteries at each station with a similar polarity. The system is applicable for work with any number of stations and any number can hold conversation at one time. The system is also arranged with a master calling button which will ring all the bells in the system simultaneously, a feature which commends itself readily in factory or commercial installations for various reasons. The telephones are arranged in several convenient forms, two of which are shown in the illustrations of this article.

## Underground Construction

G. J. NEWTON.

There are various styles of conduit in use, anyone of which, when properly laid will give entire satisfaction. The Vitrified Clay Conduit is made in three styles.

First: Single ducts having square ends; this conduit requires special care in laying as it is liable to get out of line if the mortar on the joints is not thoroughly hard before the concrete is filled in.

Second: Single ducts, self centering; this conduit can be rapidly laid as it is not necessary to have the joints cemented and the concrete can be filled in as fast as the ducts are laid without danger of getting them out of line.

Third: Multiple duct conduit; this conduit as its name implies is two or more ducts in one unit, the more common sizes being two, four, six and nine ducts; this conduit comes in three foot lengths and is heavy to handle, it being held in line by either dowel pins or keys; the joints on this style of conduit are wrapped with a strip of muslin or tape and then covered with neat cement mortar.

Where more than two ducts are to be laid the multiple duct will be more satisfactory than the single duct; whichever style is used the completed conduits should

form as near a square as possible that is if sixteen ducts are to be laid make it four ducts wide and four high.

In laying conduit of all styles the joints should be broken so that two joints do not come together.

Fibre conduit comes in lengths of six feet, is self centering, light to handle and can be laid very fast and when incased in a concrete envelope makes a very satisfactory system; the freight and cartage on this conduit is much less than on clay conduit owing to its lightness.

On account of the length of the sections of fibre conduit it is not as flexible as the single duct clay conduit but any desired angle or bend can be had from the manufacturer.

Wooden conduit, or pump-logs as it is sometimes called is eight feet long, having a three inch hole bored through it and is self centering; the joints should be wrapped and coated with pitch or tar; this conduit is probably the cheapest to use as it can be laid on a 1½ inch plank and covered with a one inch plank and the earth tamped in around it, no cement being required; the conduit and planks if treated with creosote will last a long time.

Before laying out the plans for the conduit get all the information possible as to the location of water, gas and other pipes so as to choose a section of the street that is as free from obstructions as possible. Whenever there is any doubt as to the location of such pipes it is advisable to dig a "test hole" in each block so as to locate the position of pipes, etc.

#### TOOLS.

In selecting tools it is advisable to get good ones at the start, poor tools cost nearly as much as good ones and are continually out of repair and seldom last long enough to complete one job whereas good tools will last until completely worn out; all tools should be marked plainly with the name of the company, using a branding iron on wooden tools and a steel stamp on others.

A tool box mounted on wheels will be a great help in keeping the tools from being mislaid and will facilitate moving from place to place; following is a list of tools that will nearly always be required and should be kept in the tool box for use when needed:

One sledge (12 to 14 lbs.), 2 stilson wrenches (large and small), 1 axe, 2 crow bars, 1 hand axe, 1 cross cut saw, 1 hack saw frame and blades, 1 oil can, 5 gal., galvanized; 1 water pail and drinking cups; 500 feet chalk line and chalk, 2 heavy pails, 2 trowels, 1 pipe cutter (to cut 3 inch pipe); 1 chain pipe wrench, extra lantern globes (red and white), extra lantern wicks, waste, 100 feet tape line and 2 files. If rock has to be removed there should be drills and striking hammers.

For removing pavement and excavating the following tools will be needed, the number of each will depend on the amount of work to be done:

Round point shovels, square point shovels (mixing concrete), picks best quality R. R. pick, 6 inch dirt tampers, iron handles; paving rammer, garden rakes, to mix and lay concrete; asphalt cutter, white lanterns, red lanterns, square concrete tamper 10 by 10 inches, wheel barrows (steel tray are best), hose and coupling for hydrants and wrench.

There should also be provided a suitable number of bridges for street crossings so as to cause as little inconvenience to traffic as possible; the bridge for cross walks should have hand rails on each side to prevent accidents and when left over night should be provided with lanterns.

Most new tools will require to be sharpened before they are fit to use and must be kept sharp in order to do good work. This is accomplished best and cheapest by having a portable forge on the work all the time which if stationed near the tool box, the blacksmith can keep the tools in repair and be responsible for them. There should be extra handles provided so that a broken one can be replaced—a broken tool is soon thrown away when a small expense would make it as good as new.

This may seem to some to be an expensive preparation but the amount saved in the end by being prepared will amply repay the first cost and the work will not be delayed at a critical point for the lack of something that has been forgotten.

Owing to the uncertainty of obstructions being in the way of the conduit it is seldom possible to decide on an exact depth for the conduit; therefore a plan laid out at first for the depth and grade can seldom be followed except by going so deep that all pipes will be over the completed conduit; this in many places would cause unnecessary expense. It is therefore advisable to provide a "land level," the use of which will insure that the conduit

has no pockets or low places between manholes and will enable the manhole covers to be set at a proper height as regards the pavement; a level suitable for this work can be purchased for \$25 to \$35.

#### THE TRENCH.

Having decided on the location of the trench and number of conduits to be laid with the chalk line, lay off the width which should be six inches more than the duct measurement to allow for the concrete envelope (3 inches on each side) or for retamping the earth where no concrete is used. The trench should be completed from manhole to manhole before any concrete base or conduit is laid so that you are sure you will not meet with any obstructions, the depth of the trench will depend on the number of ducts laid but in no case should the top of the concrete covering the ducts be less than 16 inches from the pavement.

In doing the excavating and removing the pavement care should be used to keep the gutters and sewers clear and not obstruct the sidewalk more than is absolutely necessary. It is better to complete one section as fast as possible and not have a whole street blocked for several days. By starting the work where there are only a few ducts and little traffic you can break the gang in and so proportion the men that the work will proceed in a uniform manner.

Having the trench down to a suitable depth the bottom should be carefully leveled giving a drop of 4 to 6 inches between manholes, after which it is ready to receive the concrete base which is mixed one part cement, two parts sand and four or five parts stone or gravel. The sand should be sharp and free from earth; the cement and sand should be thoroughly mixed dry then add enough water to make a soft mortar, after which the stone or gravel can be added.

In mixing and laying the concrete the ordinary garden rake will be found to give a better result than simply turning it over with shovels.

The concrete having been distributed in the trench, is tamped down with a concrete tamper until it is smooth and the water appears on top; after which the conduit can be started.

Tile conduit comes in various lengths so that "joints can be broken;" that is if the regular conduit is 18 inches there will be some 6, 9 and 12 inch pieces. By using care in starting you can generally come out fairly even at the other end and have no two joints in the same place; the exact method of laying will depend on the style of conduit used but joints should always be broken.

#### SINGLE DUCT CONDUIT.

This conduit not being self centering must be laid with great care so that a continuous duct is preserved and a mandrel will be needed to pull through the ducts as laid to clean out any dirt or cement that works through the joints; the mandrels are either of wood or iron having a leather or rubber washer on one end and an eye on the other so they can be pulled ahead by means of a short rod with a hook on one end; the joints in this conduit are to be thoroughly cemented on the sides and bottom.

#### SINGLE DUCT SELF-CENTETING CONDUIT.

This conduit has a projection on one end and a recess on the other so that in laying, the continuity of the duct is preserved and the joints do not require to be cemented, but a mandrel should be drawn through to clear out all foreign substances.

## MULTIPLE DUCT CONDUIT.

The method of joining this conduit differs from the single duct for owing to some of the ducts being in the center it would not be possible to seal each duct up separately; also to avoid any unevenness the sections must be held absolutely in line; this latter is done in either of two ways. By using short iron dowels placed in the walls between the ducts or by the use of dowels or keys which fit in slots in the outside walls, the advantage claimed for the latter is that a section can be removed and replaced easier where keys are used.

In making the joints on both styles the following method is used; a strip of muslin 6 inches wide is placed under the joint (3 inches lapping the end of each section) this is brought up each side and the ends overlapped and the whole covered with neat cement mortar; the ends of the conduit are scored to allow the cement a better grip on the sections.

In laying any style of tile conduit each piece should be inspected to see that no rough or uneven places are in the ducts; if these projections are small the section can be used by turning the rough place on top.

Where more than two ducts of tile conduit are to be laid the multiple duct is best and there is another advantage this conduit possesses, viz: owing to the ducts being square the friction of pulling cable in is less than in a round duct, also more than one cable can be pulled in one duct easier than in a round duct.

## FIBRE CONDUIT.

There are many advantages claimed for this style of conduit and when properly laid it will give perfect satisfaction. It is generally furnished in six foot lengths, being light to handle and saves considerable in freight and cartage; it can be cut to any desired length and the ends redressed with a tool so as to make a perfect joint. This conduit is self-centering and can be rapidly laid but should, like the tile conduit, be encased in a concrete envelope.

In laying the tile conduit it should be ended two feet outside of the manhole walls until they are built up to the proper height when the mason can fit the remaining sections, thus bringing them into the wall the proper distance to meet the finishing brick on the inside of the manhole; these brick have one corner rounded off to prevent the cable resting against a sharp corner. Where concrete manholes are used the opening to the conduits can be neatly formed with a trowel.

The conduit being laid from one manhole to another, the cement on the joints firmly set, the concrete envelope can be completed; if the trench is six inches wider than the conduit no boards will be required to form the sides of the envelope as by allowing three inches on each side the trench itself will act as retaining walls and make the envelope of a uniform thickness. The concrete over the ducts should be from 3 to 5 inches thick and carefully spread with a rake and tamped smooth with a concrete tamper, care being taken not to tamp heavy enough to crush the conduit.

The concrete should be allowed to set before the earth is filled in and tamped down, after which the pavement is laid and the street thoroughly cleaned up.

As far as possible the conduit should be kept at the same depth and laid in line in entering and leaving manholes as this will facilitate rodding. The ducts and the cables in the manholes will present a more uniform appearance.

Iron pipe of the proper size is generally used from the manholes to the distributing poles and should extend up the pole ten feet from the ground to protect the cable from injury; these pipes should always be lowest at the manhole so that water will not remain in the bend of the pipe where it can freeze in cold weather. If, owing to the nature of the ground, the pipe has to be lower at the pole, it is advisable to bore several one-half inch holes in the pipe at the lowest point and under this point dig a hole and fill it with stone up to the pipe to act as a drain; after the cable is in the pipe the top should be stopped with oakum and sealed with compound to prevent leakage of water.

Wherever the conditions will permit, the pipes for distribution purposes should enter the manholes at the end farthest from the office; this will save cable and will result in a neater looking manhole.

The ends of all conduits should be securely plugged with wooded plugs when work is stopped at noon or night.

## MANHOLES.

Manholes can be built of brick or concrete as preferred; there is very little difference in price which ever method is employed, but which ever method is decided on, the work should be carefully done. If brick is used a medium grade will answer the purpose.

In excavating for the manholes leave sufficient room outside of the walls to thoroughly tamp the earth in again and the depth should be such that a concrete floor five inches thick can be laid in the bottom and leave two feet from the bottom tier of ducts to the floor.

The size of manholes depends on the number of cables that are to be used; if the cables are small the splices will be short but where large cables are used it takes considerable room to bend them around the manhole and leave sufficient length of cable to make a neat splice.

Formerly it was the practice to use manhole tops having an inner and outer cover, the inner cover resting on a rubber gasket and being held in place with a cross bar and bolt, thus making the manhole air and water tight. As most conduit systems will accumulate more or less gas these manholes prevented any free outlet for the gas which resulted in explosions frequently. The safer method is to have but one cover which has three-quarter inch holes bored in it, this allows the gas to escape and as the top of the cover is slightly higher around the holes there is not much surface water leaks in.

In laying the concrete bottom for the manhole one corner should be lower than the others or a slight "pocket" made in the center so that if it is necessary to pump water out the pump will be able to clean all of the water from the bottom.

Where manholes are built alongside of the trolley tracks it is a good plan to secure a good bond wire to the rail and lead it into the manhole as it will probably be needed later to guard against damage from electrolysis and while the construction is being done this bond can be put in easier and cheaper than later when it would probably be necessary to take up the pavement again.

Unless the manholes are small the iron top or head will not completely cover the manhole. It is therefore necessary to corbel the upper courses of the brick work in order to reduce the size of the opening. This same object can be accomplished easier in the following way—build the walls up to the full height straight and place the I beams as required, using sheets of expanded metal to fill in all openings, the concrete is then laid on the expanded metal and when set will form a solid top or roof to the manhole.



# Talks and Queries

## READERS, PLEASE NOTE

A large proportion of our readers send in queries without inclosing stamps, requesting that we answer by letter. We are glad to answer their inquiries so that they need not wait until the next issue for reply, but we must insist that postage stamps be inclosed, otherwise the queries will remain unanswered. Several have asked questions that would require a volume to answer, and in these cases we will have to refer the writer to books relating to the subject. We are sure that our readers will not feel offended if we do not go into elaborate details when the information can be found in standard telephone literature, written better and more plainly than we can explain it.

Editor Sound Waves:—Can sound waves be transformed into electrical waves? If not transformed, how would you state it.  
V. L. B.

Answer—We do not see why the expression “transformed” is not pat unless you mean SOUND WAVES as a paper. We also try to electrify our readers, but do not think that our efforts are quite like the transformation of energy. Perhaps the expression “transmutation” of sound energy might suit some people better than transformation. Do not speak of the transformation of sound waves but the transformation of the energy of sound waves.

Editor Sound Waves:—Will you please tell me the correct way of making the resistance coil to be used in the receiver circuit of a telephone, say 1,000 ohms, also of 500, 800, and 1,600 ohms, making use of carbon as the resistance medium? The resistance to have metallie ends arranged so that they may be soldered into the circuit of a receiver. What resistance would be the best so that the volume of sound will not be cut down? I would like to have the method of making these coils explained to me so that I can go ahead and make them. I find that there are some of the people on my line who will have the receivers down when others wish to ring, and as this interferes I wish the resistance to prevent the trouble.

Answer.—We do not think that you can possibly make these resistances. It is a very particular kind of work, which requires delicate measuring instruments and an elaborate plant. It would be cheaper for you to buy the resistance coils from some telephone manufacturer and then you will get what you wish. A condenser in the receiver circuit will give much better service than a resistance and will not cut down the transmission as much. A condenser of about a micro-ferad capacity is the size generally used. They would cost not more than fifty cents each.

Editor Sound Waves:—You will find enclosed a clipping from San Francisco in regard to a repeater said to have been invented by a man in that city. Will you try to let us know as much as possible about it in the next issue of Sound Waves? The clipping reads as follows:

San Francisco, Cal., April 16.—David C. St. Charles, an engineer of this city, has invented a repeater which will make it possible to telephone from here to New York. What the so-called “repeater has done for telegraphy.” St. Charles’ invention, it is now claimed, has done for the telephone. The combining of the echo, in nature with the sounding board of a violin, furnished the clue to the discovery, according to a statement of St. Charles. Supt. John W. Glass of the local telephone company is quoted to the effect that the invention is a success.

Answer.—Of course we have not seen the invention and do not know upon what principle it may be based but we can pretty safely say that the man is not going to put the existing state of things out of business just yet. There are many people who do not know that the

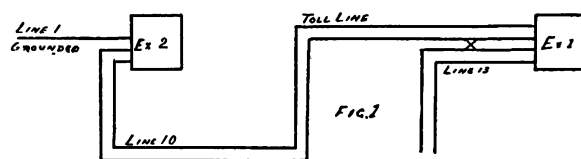
reason that we cannot talk over great distances is not because we cannot get telephones sufficiently strong but because of certain line conditions over which the telephone has no power. Because of the electro-static capacity of the long lines it is impossible to talk over unlimited distances. If there were nothing but the resistance of the line to overcome, then there might be a relay invented which would cause the voice currents to be reinforced at intervals in a similar manner to the telegraph relay. The capacity of a line causes the voice currents to be distorted out of all resemblance to the currents as they were at the starting point. Therefore in order to affect any increase in the distance over which it is possible to talk, the effect of the capacity must be overcome. This can only be accomplished by changing the line design. This is what Dr. Pupin did when he designed his load coils. These coils are impedance coils of a certain design which are placed at intervals along the line and they neutralize the capacity effect.

The repeater inventor is almost as prolific as the automatic car coupler man was some years ago.

Editor Sound Waves:—I have a problem for you. We have toll line seven miles long from exchange No. 1 to exchange No. 2. Each exchange has several party lines. Now if exchange No. 1 rings on line 13 it will ring line 10 and line No. 1 at exchange No. 2 and parties on No. 1 line at exchange No. 2 will answer calls that exchange No. 1 rings on line No. 13 in exchange No. 1. Also parties on line 13 ringing each other will call parties on line No. 1 at exchange number 2.

Now the cause of this trouble was a cross on number 10 and 13 near exchange number 1. But the question is, why should that interfere with line number 1 in exchange number 2. I have taken line number 10 and line number 1 out of the cable at exchange number 2, thinking that there might be trouble in the cable. I have also examined the carbon block and still the same trouble occurred until I uncrossed line 10 and 13 and then it was all right. One thing I forgot, when exchange number 1 rings on line 10 (toll line) it does not interfere with line number 1 in exchange number 2 and there is no cross talk from number 1 line and number 10 line at exchange number 2.

Answer.—Line number thirteen is a metallic line and so is the toll line. Line number one is a grounded circuit. Here is your trouble which we think will be found to be true. One side of line thirteen is crossed with the one side of the toll line number ten, the other side of number thirteen is grounded at some point. The drop of the toll line at exchange number two is grounded on the metal frame and so is the drop coil of line number one on the same switchboard. When exchange number



one rings on line thirteen a circuit is established through the cross to one side of the toll line, the toll line drop on the number two exchange, the frame of the drop to the frame of number one drop, number one drop coil and also number one line. The return circuit is then made through the ground to the ground on line thirteen

and then back to the generator. When ringing over the toll line the two grounds do not enter in the same way and hence there is not the trouble from the cross. Test out the drops and line number thirteen and see if we are not right. For the information of our readers we are showing the diagram of this case of trouble. Figure 1 will explain the difficulty. This would be quite a puzzling case to one who is not in the habit of sitting down and studying circuit combinations. The best way to locate a puzzling case of trouble is to draw the circuits and then see just what combination will produce a certain result.

Editor Sound Waves:—I have a query that I wish to ask of you. I have for the past few days, had trouble with the operator's circuit. The operator cannot hear any one talk or can subscribers hear her. The trouble seems to come and go, some times the words cut off and then they come up loud and clear. This same trouble occurs in ringing subscribers, one time we can get them and at another time we cannot. Yesterday we could not get anybody and the operator had to connect with the booth to find out what was wanted. We have no trouble after they are connected up. To-day the trouble seems to come and go. I have examined the keys and circuit well but cannot locate the trouble. If you can locate the trouble I will be many times obliged.

Answer.—In the absence of any information to the contrary, we will assume the board is wired metallic circuit and that the circuits are the same as that ordinarily used and that the system is what is known as magneto. It is always better to give all details as the editor cannot tell by induction.

As you can talk over a connection, the contacts in the keys which are in the talking circuit must be good. When you throw the ringing lever to call a subscriber,

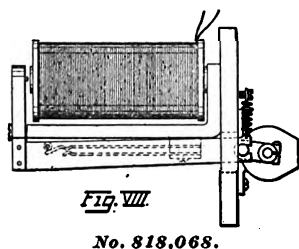
very likely there is not a good conduct made and that accounts for the poor ringing. The same applies in throwing the lever to the listening position. Be sure and examine the outside contacts of the listening and ringing keys for it is very likely that your whole trouble is there. This is the only place where one case of trouble will cause the double difficulty. If the trouble is not there, there must be two cases of trouble. Test the operator's transmitter and receiver cords. Also examine your generator for a bad connection at some place. Examine all the connections to the listening and ringing keys and to the operator's circuit.

Editor Sound Waves:—I am enclosing a diagram for you which shows a combination fuse, carbon and heat coil arrestor. I have always thought that the line wire should be connected to the carbon side of an arrestor. Some say that there is no difference. This arrestor is stamped for the line wire to come in on the fuse side of this arrestor. Kindly tell me in the next issue what you think of it.

Answer.—In this case we think that you will find that the fuses are of a capacity that is quite large and that they will allow lightning to pass unless of extra large volume. The carbon blocks will take care of any ordinary lightning. The heat coils will take care of the sneak currents and the fuses will blow when there is some strong current such as an electric light current. When a high voltage (300) current comes in, both the heat coils and the carbon blocks will operate and ground the line. This forces the fuse to blow and thus protects the protective apparatus from being destroyed. The blowing of a heat coil alone will also cause the fuse to blow, for the grounding of the circuit will likely increase the current on the line to the point where the fuse blows.

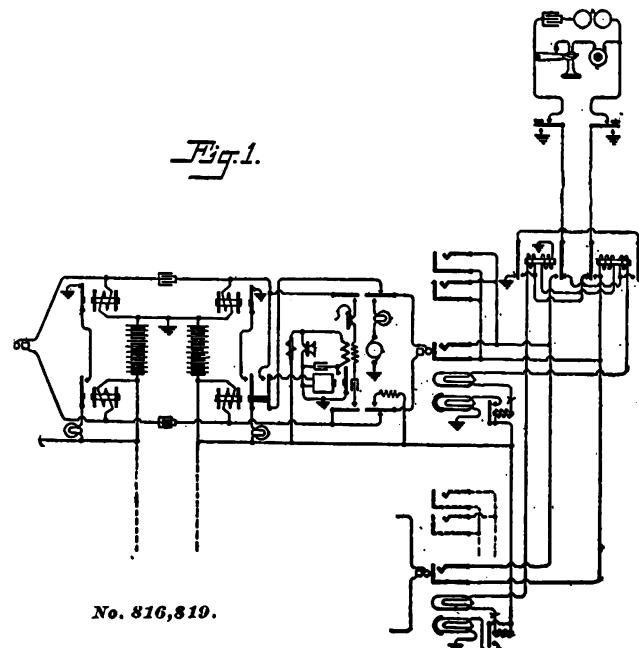
## Telephone Patents

Clarence E. Wright, of Cleveland, Ohio, assignor to David A. Yoder, of Toledo, Ohio, registering apparatus for telephone exchanges. Patent No. 818,068, April 17, 1906. This invention relates to improvements in registering apparatus for telephone exchanges and the circuits therefor, and has for its object the provision of means whereby both the number of calls and the elapsed



time an operator requires for connecting or disconnecting may be positively registered. It consists of a controlling circuit closer at the exchange, of an electrically operated counting mechanism, an electrically operated timing mechanism and means for simultaneously connecting current with each upon the actuation of the controlling circuit closer, whereby the signaled call or disconnection and the elapsed time in responding thereto are both registered.

Howard M. Post, of Chicago, Illinois, assignor to Kellogg Switchboard and Supply Co., of Chicago, Illi-

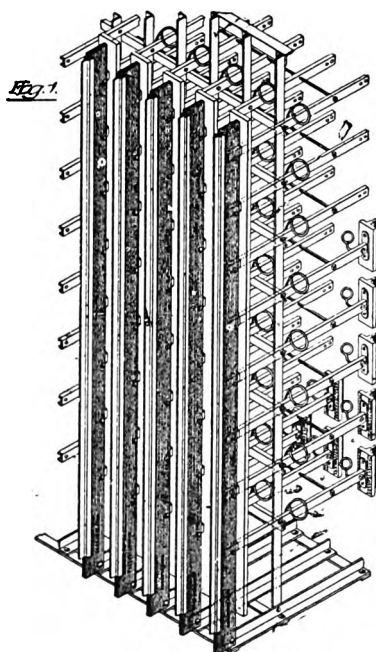


nois, a corporation of Illinois, two-division telephone system. Patent No. 816,819, April 3, 1906.

This invention relates to a divided multiple switch-board system, my object being to provide a system of this type in which the sources of energy are all located at the central office, in which a minimum amount of apparatus for each line is required, and in which only two wires extending throughout the switchboard are employed for each line, and, further, to provide in such a system suitable apparatus for connecting the subscribers together and for properly supervising and attending the connections. It consists of a telephone line extending from a substation to the central office, of a calling signal for the telephone line in each division of the switchboard, two relays for the line each controlling one of said signals, means for singly operating either of said relays from the sub-station to actuate the corresponding signal, and means for operating both of said relays when connection is established with the line at either of said divisions to render said signals inoperative.

Frank B. Cook, of Chicago, Illinois, iron-framed distributing-board for telephone exchanges. Patent No. 816,847, April 3, 1906.

In telephone systems it is the practice to employ at the central stations what are ordinarily known as "distributing-boards." These distributing-boards are employed as a means for uniting the incoming line wires with the wires or conductors leading to the switchboard apparatus. Ordinarily in a structure of this character the arrangement is such that the connections can be made or broken at will and also such that the connections may be interchanged.



No. 816,847.

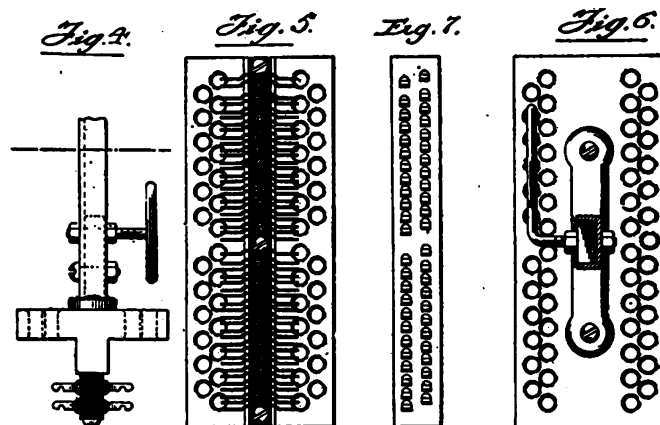
Generally stated, it is the object of my invention to provide an improved iron-frame distributing-board which will facilitate in the connecting and disconnecting of the line wires with the switchboard wires.

A special object is to provide a construction and ar-

range whereby the line wire cables may be led into the back of the board either vertically or horizontally and with as much facility one way as the other.

It is also an object to provide certain details and features of improvement tending to increase the general efficiency of a distributing-board of this particular character.

It consists of a supporting frame, the said frame having horizontally disposed rearwardly extending arms, a

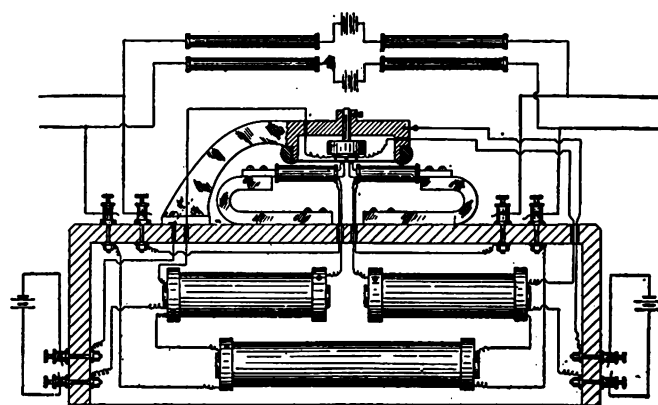


No. 816,847.

plurality of vertically disposed supports secured to the forward ends of said arms, and terminal blocks secured to the rear ends of said arms, said blocks being arranged in rows, both vertically and horizontally there being but a single supporting arm for each block, and the blocks all being readily removable from their respective arms.

Merrit Gally, of Brooklyn, New York, telephone repeater. Patent No. 817,761, April 17, 1906.

This invention consists of a telephone repeater for repeating telephone pulsations from one telephone line to another telephone line; means for receiving the pulsations for both of the telephone lines; transmitting means



No. 817,761.

for repeating the telephone pulsations from one of the telephone lines to the other telephone line; and an independent induction coil having two wires establishing inductive relations between the two telephone lines; one of the wires of the coil to connect with one of the telephone lines and the other wire to connect with the other telephone line.

# Suicide

W. J. STADELMAN.

There are many well-organized, good intending companies that have suffered defeat and have not known the cause until too late. They are invariably absorbed by companies that work strictly on business line or they have come to the reorganization period, being compelled to reorganize with the original investor the loser.

A company is formed, for example, in a town and the stockholders and officials decide on a price to be charged for the telephone service, making it always the lowest possible rate, based on the conditions which prevail at that time. Suppose a \$2 rate for a business telephone and \$1 for a residence phone is charged. This is about the rate charged by the smaller systems. After the solicitors have completed their work all the business houses or higher rate telephone subscribers have been secured, necessarily making the additional business come from the lower rate or residence telephones. What does this condition produce? It compels the placing of all the short wires or lowest cost telephones (per installation) in first, for which you get the highest rental, also from which your rate has been established. Each year of business finds new subscribers emanating from the outlying portion of your town and the telephone is installed at a far greater cost per telephone than when you first started in business.

To make this thoroughly clear, take, for instance, a town of 500 subscribers. The \$2 phones will be installed within a radius of four blocks from the central office, at a cost of about \$30 per installation, and the new business, outside of the five-block radius, which will consist of the subscribers that you procure in the first and second years, will cost about \$45 per installation. After three years of operation the territory immediate to the central office has been covered and the new business and increases must be accepted at the cost of \$60 per installation. It will also be embarrassing to note that the growing business is not on an equitable ratio. The two-dollar, or business phones, will be taken at the rate of one business phone in six months to twenty-five residence phones in the same length of time. This condition, it is readily seen, would give \$24 per year for a telephone which costs \$30 to install and \$12 per year for a residence telephone which costs \$60 to install.

In the first instance 80 per cent. of the installation is received, in the second instance but 20 per cent. of the installation cost, and the ratio of installing the business for six months is twenty-five instruments on a losing proposition against one on a profitable proposition, not mentioning at all, the cost of operating or maintenance, both being much greater on the new business, or long lines, than on the short original lines upon which the rate of income has been based.

These facts should be conclusive evidence that a sliding scale is equitable and should be employed in the managing of successful telephone companies.

If a company has 100 subscribers, one subscriber talks to ninety-nine people, but if the same company has 200 subscribers, then one subscriber talks to 199 people, each subscriber being placed on the same

ratio for interchange of service.

This same condition of affairs applies to extending the lines from one town to another and giving free service. To give free service between two towns does not work much hardship if it is stopped there, but many new companies think that if they give free service between two towns that they can keep on extending forever. Let us see. Take for instance, free service between six towns. Town No. 1 can talk to towns Nos. 2, 3, 4, 5 and 6; town No. 2 can talk to 3, 4, 5 and 6; town No. 3 can talk to 4, 5, 6 and so on. Then reverse these towns and No. 6 can talk to 5, 4, 3, 2, 1, and so on, making in all a combination of 82 exchanges, and this is produced by giving free service to only six towns. Is there any wonder that Independent telephone companies go broke under such pressure? They are bound to fail and must give way to the companies that are organized and that operate on a business basis and business principles.

Figures are not very interesting reading, but in order to get at facts I am compelled to use figures. I am in possession of the record of a town where free service has been given to a neighboring town and out of this town in the year 1904, seven hundred twenty-seven paid messages were originated passing through this free service town. In the same length of time, 28250 free messages were handled to the free town, making a daily average of seventy-seven messages. This employed the exclusive service of one operator to take care of the free business and as there was only one toll line to this town the same was rendered useless for commercial purposes, making the cost of building and maintaining the same a direct loss, and in fact a burden, not only to the owners but to the subscribers, for in many cases the business man was willing to pay to get his messages through, but was unable to do so on account of the free service, and the amount of remaining business that was willing to pay was not sufficient to warrant the stringing of another pair of wires; therefore the company was compelled to maintain a toll line at an actual daily loss.

In connection with giving free service there is another item of great importance which has been sadly neglected, that of setting aside a certain percent for depreciation. This neglect has hastened the failure and ruin of many a good company. It is unfortunate that the depreciation period does not put in its appearance in the first few years of operation. It generally becomes noticeable after about the fifth year, then it becomes very pronounced.

If mutual companies would learn to confine themselves to a very small district, and never extend, their success would be assured. I have in mind a company of twenty subscribers that operates a line ten miles in extent, and these people have decided never to build any more or to take on any more subscribers, as they have their territory covered, and they have been operating at an extremely low monthly rental and have been in existence four years. Their present condition will continue, providing they confine themselves to their original plan, but should they ever decide to extend or get the growing fever without changing their rates, the inevitable will happen—suicide.



# Notes of the Field and Trade

At Elkhart, Ind., in the district where the resolution was adopted to the effect that any telephone company having either direct or indirect traffic relation with The Central Union (Bell) Telephone Co., be cut off from all association with the Independent Telephone Companies, providing such companies refused to sever connections with the Bell after receiving due notice, very little trouble was experienced in enforcing the order. After thoroughly understanding the situation, three small companies having Bell toll lines in their office, promptly removed them, and were glad to do so. Prospects of a Chicago connection which will include Elkhart are bright, and telephone men there are very enthusiastic over it, for when this connection is made they will be in a position to compete with the Bell to the fullest extent.

The Sixth District Indiana Telephone Association, of which Mr. Earl Talbot is president, and Mr. Jesse W. Week, secretary, held their quarterly meeting in the telephone office of the Citizens' Telephone Co., at Brazil recently. Delegates to both the state and national meetings were selected, followed by a general discussion of items of interest to members of the district. Mr. Coffey, of the United States Long-Distance Telephone Co., was among those present. The meeting adjourned to meet at Linton, August 8, 1906.

The American Vitriified Conduit Co., heretofore with general offices Maiden Lane Bldg., Broadway, N. Y., handling vitriified salt glazed underground, and interior conduits, and contractors for complete installation of conduit systems, removed its offices May 1st from the above location to the Fuller Bldg., Broadway, Fifth Ave., and 23d street.

Fire in the plant of the Central Indiana Telephone Co., at Sheridan, April 19, destroyed a cable box, melted some cable and caused other damage of not a serious expense, however, to the company, but of considerable inconvenience to thirty or forty subscribers whose lines were effected. Repairs were quickly made and business resumed.

J. L. W. Zeitlow, president of the Dakota Central Telephone Co., Aberdeen, S. D., is back in the harness again after a two months' pleasure trip through the south and west. He reports everything flourishing in South Dakota, and is especially proud of their new automatic exchange in Aberdeen.

The value of preservatives for telephone poles has not been appreciated by the Independents to any great extent in the past, but many are now investigating the merits of all available compounds. The Western Union, Postal and Bell companies have been using them to good advantage for the past eighteen or twenty years with very satisfactory results. The two preservatives most prominently before the public are: Avenarius Carbolineum

Phenolium. Treated with these, the life of any pole is materially increased.

William Hubbard, Elgin, Ill., an old time telephone expert is now with the Postal Typewriter Co. Mr. Hubbard assisted B. F. Wasson, Clinton, Ill., in furnishing and collecting the unique exhibit now at the Purdue University. This was exhibited at the St. Louis Exposition to illustrate the "Evolution of the Telephone."

A. E. T. Technical Club.—Blk face caps and l. c.

The employees of the American Electric Telephone Company have organized a society among themselves under the name of the A. E. T. Technical Club. The first regular meeting of this society was held April 14, 1906, and the enthusiasm which the idea has already aroused is very encouraging to those of the American employees who have taken up this matter of bringing about a means through which the more progressive employees of a large company may come together at certain times and discuss matters pertaining to their work and other subjects of interest.

The books of the club show a membership of sixty. About one-half of the members are of the nontechnical class, i. e., they are employed outside of the engineering and office departments, which shows that the average employee is ready to grasp any opportunity to add to his knowledge.

At the April 14th meeting of the club, Mr. C. J. Larsen presented an article illustrated by complete drawings and describing in a very thorough manner, the American Company's Eight Party Selective Telephone System. After the presentation of the paper, an interesting discussion took place.

The meetings of the club will be held every two weeks. The second regular meeting, therefore, was held April 28th. At this meeting Mr. Max W. Zabel read a paper on "Elementary Telephony," and presented the subject in such a manner that every member present thoroughly understood the paper and the twenty diagrams accompanying it. The discussion was very interesting, and among other points, it was clearly demonstrated why a telephone should be wired in a certain manner in order to prevent induction coils from being burned out by lightning. Mr. William M. Davis, former chief engineer Stromberg-Carlson Co., also gave an instructive talk on this subject.

The club has issued printed copies of its constitution which contains seven articles in thirty paragraphs.

The officers of the club are as follows: President, H. P. Clausen; vice-president, C. J. Larsen; treasurer, W. L. Dolman; secretary, P. H. Woodruff; board of directors: H. P. Clausen, Richard Leimann, A. H. Geller, D. R. Hoffman.

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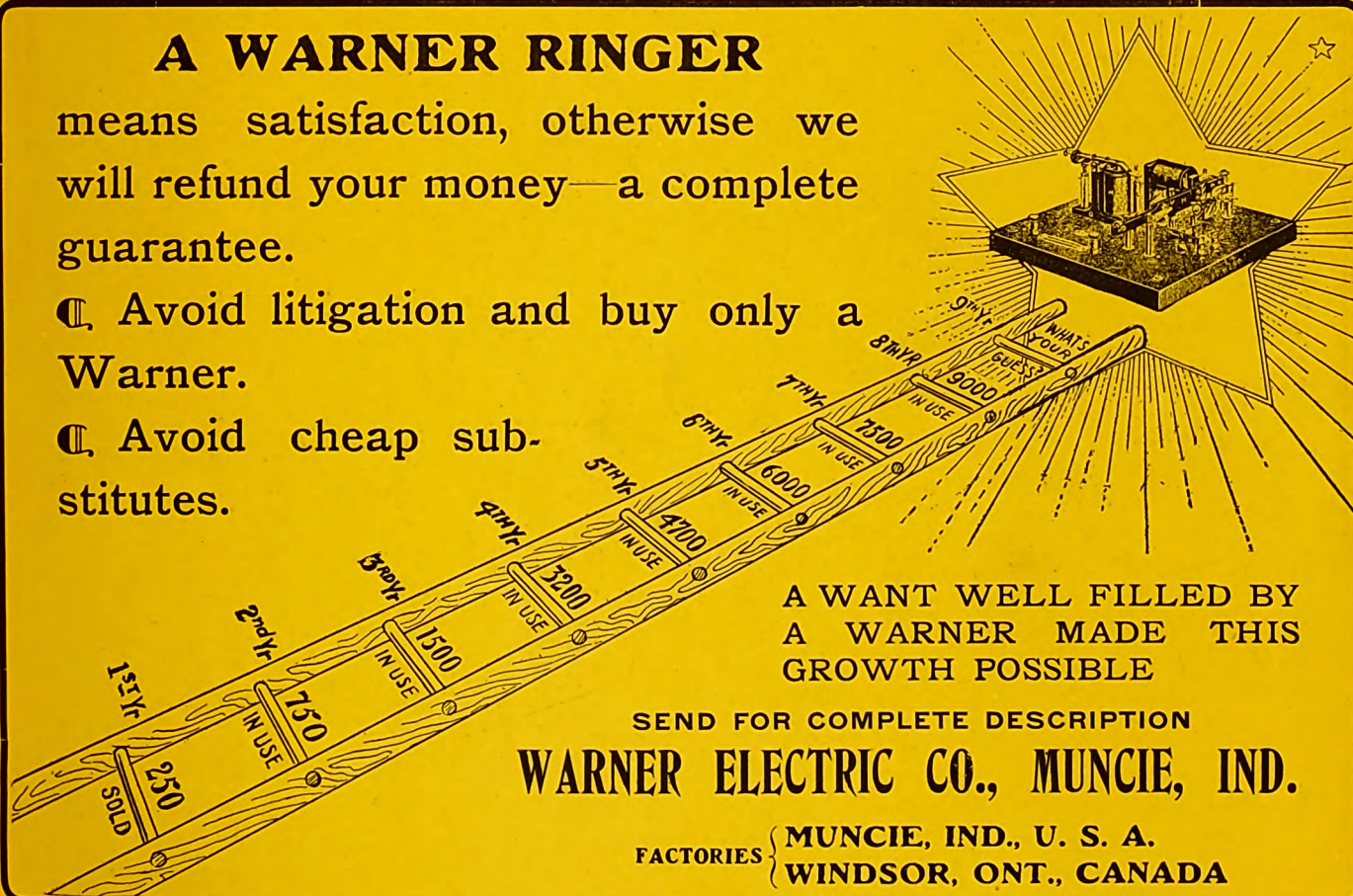
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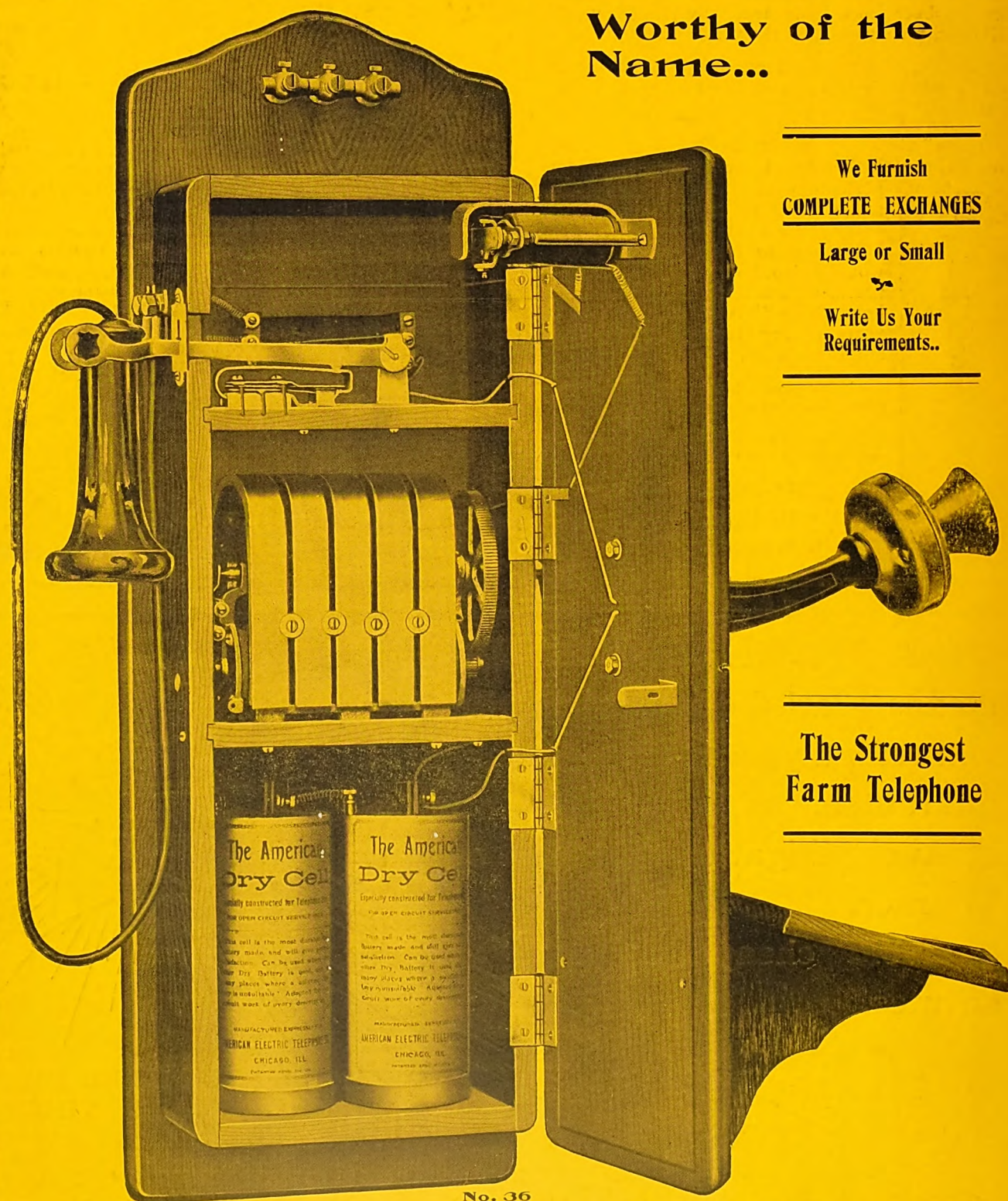
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AN ADVOCATE OF  
INDEPENDENT TELEPHONY

VOL. XII  
No. 2

JULY  
1906

Published Monthly by THE THOMAS H. WILSON CO., Logansport, Indiana

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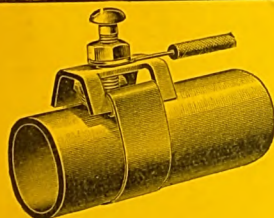
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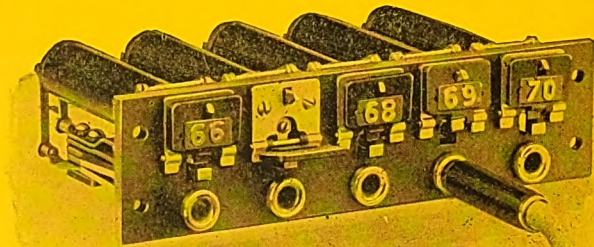
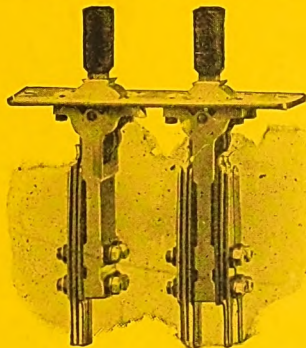
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# MONARCH



THE two most important parts of the switchboard being the line signal and the ringing and listening key, we illustrate a strip of Monarch drops and jacks and a Monarch ringing and listening key with ringback. These parts have now been on the market for a period of two years and during that time they have proven themselves to be most efficient and durable. The fact that the armature of the drop is mounted in front of the coil and that the coil can be removed without breaking any soldered connection and without disturbing the armature is a feature that is appreciated by all practical telephone men. The additional advantage secured from this construction is that the adjustment of the armature is positive and permanent.



The ringing and listening key shows the same careful consideration of small details which is so apparent in all Monarch equipment. The mountings for the springs are solid brass so formed as to afford a most substantial support. The springs themselves are made of German silver and the contacts are pure platinum rivets. Little feature of this kind will interest anyone in the market for switchboard equipment and an investigation will pay.

A complete exhibit of Monarch Telephones and Switchboards will be found in Rooms 642 and 644 during the National Interstate Telephone Association Convention, June 26 h, 27th and 28th.

## Monarch Telephone Mfg. Co.

CHICAGO, U.S.A.



# SOUND WAVES

A Monthly Magazine Devoted to the Interests of Independent Telephony

Vol. XII.

JULY, 1906

No. 2

## SOUND WAVES

PUBLISHED MONTHLY AT LOGANSFORT, IND., U. S. A. PRICE FIFTY CENTS A YEAR  
COPYRIGHT, 1906.

Entered as second-class matter July 14, 1903, at the Post Office at  
Logansport, Indiana, under Act of Congress of March 3, 1879.

The Thos. H. Wilson Co., Logansport, Indiana, Proprietors and Publishers

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Telephone, Chicago Office, Harrison 1521, Chicago Telephone Co.  
Telephone, Chicago Office, 2904, Illinois Telephone Co. (Automatic)

## SUBSCRIPTIONS

One Year, United States and Canada	\$ .50
One Year, Foreign Countries	1.00
Single Copies, each	.10

S. BENTELL & CO., 39 Maiden Lane, Covent Garden, London, Eng., British Representatives

## NOTICE TO ADVERTISERS

Changes of Copy must be in this office not later than the 1st of each month.  
We can not insure changes of copy being made or advertisements being with-  
drawn after that date, as advertising forms begin going to press the 1st.

New Advertisements can be inserted if received by the 5th of each month  
but to insure proper classification they should be in this office by the 1st.

To mail the paper promptly, it is necessary for us to adhere strictly to the  
above, and we will appreciate the co-operation of advertisers.

Subscriptions, Etc.—Address the Logansport Office. In sending  
personal checks for books or subscriptions, include 15 cents for exchange.

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## EDITORIAL COMMENT

All communications to the advertising department of this paper should be sent to the Chicago office, addressed plainly to **SOUND WAVES**, 860 Monadnock Bldg., Chicago, Ill. All communications to editorial department, answers to want advertisements, subscriptions, etc., address **SOUND WAVES**, Logansport, Ind. Subscribers and others will confer a favor and facilitate the work of this paper by complying with the above request. Technical and news contributions will receive prompt attention and are respectfully solicited.

## MORE BELL CHICANCERY.

The Bell company will go a long way to gain its end and one is apt to keep guessing at what the next step may be. Recently we have had occasion to refuse the advertisement of the Bell-owned Kellogg Switchboard and Supply Company. We usually have to get out and hustle for advertising matter, but in the case mentioned the copy came without any soliciting and when it was refused, there were a few highly insulted Bell officials. The Bell company have been used to the subsidizing of the press for so many years that it is likely they cannot understand why their money should not be just as good as any. We are willing to admit that there is nothing wrong with the money, for the greater part of it was earned by the hard working public. It is money that we are after, of course, but we will not take it to advertise a company whose object is to support a concern which is trying to kill all competition. Some ten or more years ago when the fundamental patents of the Bell company expired, naturally there were other companies who wished to enter that line and give service according to the wishes of the telephone using public. But the Bell company fought the movement in every way that was possible, even to the destroying the opponent's plant. A great many of the Independent plants are now buying telephones and other apparatus from this Bell-ridden corporation and are forgetting the fight for existence that they had several years ago. Is this right; is this fair? Most certainly not. We feel that it is our duty to fight any move from which the Bell may receive any benefit.

The Bell Company knows very well that a paper that takes their copy can not fight it effectually. The Kellogg company did not stop with a mere refusal of their copy, but took other measures to force us.

Here is where the fine Italian hand of the publicity department in Boston came in. Oh, it is fine to have a department of that kind! it saves a great deal of worry. When in doubt refer the matter to the Milk (St) Depot.

A few days after our refusal, an inspector from the Third Assistant Postmaster General's department called upon us to investigate our circulation list. Evidently a

report had been made that we were not obeying the postal regulations. Here there was a disappointment for the Bell. There is no danger to those who are giving a square deal, and the Bell company should have learned this years ago. Those who have been attending to the interests of the Boston concern for so many years, cannot appreciate the fact that there are those who cannot be bought and who will stand for the right. Those who handle soot cannot very well avoid being blackened.

Now the question which presents itself is; are our readers going to continue the fight against the Bell or are they going to 'lay down'? In union there is strength is an old saying and it gets tiresome to those who do not wish to have it so. Every cent that is paid to the Bell tools assists the parent corporation.

Did it ever occur to the reader that the Bell concern has already tried to kill at least one company through the Kellogg branch? A patent suit was being conducted by the Western Electric Company against an exchange company for the infringing of one of its multiple board circuits. The Kellogg Company was defending the suit, as it had furnished the apparatus. When the Bell came into control an effort was made to discharge the lawyers for the defense, but they could not do so very well without giving away their hand. Owing to the great effort on the part of the attorneys in the case, the Independent company was not enjoined from doing business.

Do you as Independent companies wish to buy from the Kellogg Company and then run the risk of infringement proceedings by the Western Electric Company? Yes, the Kellogg Company will defend you (?). A poorly defended case is no defense at all.

### THE GULLIBLE SUB-LICENSEE

The Bell company certainly are working a smooth game of "Heads, I win; tails you lose." The following is a true dialogue which recently occurred, the names only being changed:

Smith—Jones, why did you ever go over to the Bell anyhow?

Jones—Well, we were up against it and practically had to do it, besides they made us a business proposition we could not very well refuse. You see the farmers started a mutual movement and were negotiating with the Bell company for toll connections. The Bell company, of course, offered them connections and that meant that we would not be in it. The Bell agent came to us and told us that they would rather connect with us than with the farmers, but if we did not they would surely connect with the mutual system and compete with us. We, of course, would have to use their transmitter and receiver, pay them two dollars per year per set, and they would give us fifteen per cent of the toll receipts. It struck us as a good proposition. Besides that, we were

privileged to purchase our supplies from the Western Electric Co., and thus secure a saving of from five to twenty-five per cent on supplies. Do you think that a good proposition?

Smith—I must admit that the supply proposition is good, but how much does your transmitter and receiver rental cost you per month?

Jones—About eighteen dollars.

To what does your share of the toll receipts amount?

Jones—About fifteen dollars per month.

Smith—I notice that you have an extra operator to take care of your toll business now. You are paying her twenty dollars per month and are losing three dollars, the difference between the instrument rental and the toll receipts, so I figure that you are losing exactly twenty-three dollars per month. The Bell company is making a gross profit of one hundred and fifty-eight dollars each month. How does that strike you? Don't you think the Bell company can afford to be kind to you? They are getting two dollars per year from each of your subscribers, an amount equal to any profit they would make if they ran their own exchange, besides they are getting a fine income from their toll business, all of which without any responsibility on their part.

Jones—I must admit that you are correct, but I have no complaints to make for I am treated with the greatest consideration. I have the privilege of the advice of the engineers of the Bell company without charge and the saving I make on the supplies is well worth the while.

Smith—Are you sure that the engineers' services are free? You have no written statement to that effect. And are you sure that you will be allowed to buy at the reduced rates indefinitely? Is not this promise made to draw you on, only to be withdrawn as soon as you have gotten well hooked? As you have nothing written you cannot hold them. Some day you may receive a bill for engineering services.

Jones—They would not treat me that way, I know, for they have been so fair right along.

Smith—If the Bell company could see that they could make more by building in your town and competing with you they would not hesitate to do so one minute.

Three weeks after this conversation Smith and Jones meet again and the following conversation ensued:

Smith—Well Jones how is the Bell alliance getting on?

Jones—Fine and dandy.

Smith—How is the Western Electric treating you?

Jones—I guess you were right the other week when you told me to look out for a raise. Last week I received a notice from the Western Electric Co. saying, that in the future I would have to pay the same for supplies from them as I would if I bought from any other house.

Smith—Now you can expect most anything.

**"Your stand is O. K. on the Bell-Kellogg situation, and should be upheld by all Independents. It is really hard to know, now-a-days, who are Independents, as the *Dollar* is usually the consideration involved, and not the principle. With very best wishes,  
Sincerely yours,"**

**We have a number of such letters from prominent operators and should hear from all. What a short sighted policy! Anyone who has the *Dollar* as his immediate consideration is making a serious mistake. Every letter received has heartily endorsed our effort.**





## SPECIAL REPORTS ON TELEPHONES

The government has recently published the information gathered by the Census Bureau, on the condition of the telephone business in the United States. In connection with this report there is a considerable space devoted to the growth of the business in Europe.

The reports do not go beyond the year 1902. It is unfortunate that it should not include some of the later years, as the result would be entirely different. During the last four years, it is safe to say, there has been more progress than during the previous twenty years. It is unfortunate that such reports can not be published sooner after the data has been secured, for, except for its historical value, this report is almost absolutely valueless. Since the year 1902 there has been an enormous gain and the results shown by the report are very misleading to anybody but one who has been following the progress of events.

Those who have done the work realize that there cannot be any accuracy in the work, for they say:

"Telephony is undergoing even now, about thirty years after the speaking telephone, a development almost without parallel. It would seem that under such circumstances the data and statistics of most weight would be derivable from comparisons made for shorter periods than decades, and might well be for five-year periods, as in the census of manufactures."

Thus it is seen that any short comings of the figures may not be laid at the doors of those who did the work.

In spite of the unreliability of the report for the present conditions there are many interesting figures shown.

The telephone systems are classified under three different heads.

1. The Commercial Systems, including all those that are operated by individuals, corporations or firms, strictly for profit..

2. Mutual Systems, those that are conducted more or less on the mutual plan, profit being a secondary consideration.

3. Independent farmer or rural lines, those having no regular exchange connections and operating on the co-operative plan.

The following figures show the number of each kind:

	Commer- cial	Mutual	Indepen- dent rural lines	Total
Number of systems and lines	3,157	994	4,985	9,136
Miles of wire.....	4,779,571	70,915	49,965	4,900,451
Number of telephones.....	2,225,981	89,316	55,747	2,371,044

It will be seen from the above table that the rural line and the mutual lines form a very small percentage of the total. It is a rather fine line which is drawn between the rural independent companies and the mutual systems. They are really practically the same to all intents and purposes. The Independent rural companies are generally purely mutual companies and should be so classified.

Since the year 1902 the mutual movement has grown enormously and the independent rural lines would make a very respectable showing. It is the truth that the great growth has been in the rural districts. The rural lines are multiplying rapidly and exchanges are being established for their accommodation. It is a fact that nearly

all of the mutual systems start from one or two independent rural lines. This is why the two should be classified as one.

Of all the telephones manufactured, it is likely that two-thirds are for use on rural lines. Of this amount more than two-thirds are used by the independent rural or mutual companies.

During the past year there were no less than 850,000 telephones turned out by the independent manufacturing companies, so that there must be at least 375,000 telephones sold to the rural companies each year. The chances are that the above figures are under the actual amount.

As the number of the rural independent lines are so small they are left out of consideration in the comparing of all other lines with the lines of the Bell companies, and they are all called either Bell or independent in later tables.

The following shows the comparison in tabular form:

	TOTAL	BELL	INDEPENDENT
Number of systems.....	4,151	44	4,107
Miles of Wire.....	4,850,486	3,387,924	1,462,562
Number of telephones of all kind.....	2,178,266	1,222,327	956,039
Total messages.....	5,070,554,553	3,074,530,060	1,996,024,493
Salaried officials or clerks	14,124	10,341	3,783
Salaries.....	\$9,885,886	\$7,848,551	\$2,037,335
Wage earners.....	64,682	46,064	18,564
Wages.....	\$26,369,735	\$21,026,257	\$5,343,478

This table shows that the number of telephones owned by the Independent companies is about two hundred thousand less than those that are operated by the Bell companies, provided the rural telephones are added to those of the independent. A census now would show that both the Bell and the Independent companies have grown to an enormous extent, and that the independent companies have about twice the number of instruments.

The large difference in the mileage of wire is, no doubt due to the fact that at that time the Bell company had a great amount more toll lines than the Independent companies. It may also be explained by the fact that the Bell companies had exchanges in the large cities and that their competitors had not yet gotten into the larger cities to any extent. As there is a large amount of dead wires in the cables of the larger systems, it is natural that these dead conductors form a great proportion of the total mileage. In large systems the length of wire per telephone is always much greater than in small systems.

The large difference in the number of systems is due to the fact that the Bell systems are much larger than those of the independent companies. The most of the independent companies do not operate more than one exchange, which most of the systems of the Bell companies have from a dozen to several hundred exchanges.

There is a remarkable difference when it comes to the number of employees. This number is out of all proportion to what one would expect. It is usually the case that combinations are made to keep down the operating expenses, but here is a case of combination where the operating expenses so far as salary-drawers and wage-earners are concerned, are much increased. The average Bell salary is about 760 dollars and the average salary for the independent company is over two hundred dollars less,

or 540 dollars. These figures are deceptive, for one is apt to think that the independent companies are poor payers. This is not necessarily the case. The independent companies do not have any fifty thousand dollar men to raise the general average, and moreover as the systems average smaller, the salary will also average less.

There is also a difference in the average rate paid to the wage-earner. This difference comes largely from the difference in the size of the exchanges. The independent companies run pretty close to the Bell in the number of messages. This is peculiar as it has generally been supposed that the Bell lines are more busy.

The independent long distance business is not supposed to amount to much, but they seem to show up in the report pretty well in that respect, as there were about 45 such messages per subscriber as against 62 for each Bell telephone. This is certainly very good for the year 1902. It would be interesting to know what it is at present. The great Bell argument has been that the independent system is of no value because there are no toll facilities. One is willing to admit that toll lines are a valuable adjunct to any exchange, but from the report, it would appear that the independent companies are not without such facilities. Of course, the greater number of toll calls in either companies were for short distances.

The total outstanding capitalization of the Bell companies was \$306,627,501, and they had bonds outstanding to the amount of \$65,673,272, making a total that is supposed to be invested in the business of \$372,300,773. This figure contains several items which amount to repeti-

tion, such as stock owned in license companies, bonds of such companies, and stock and bonds held in companies other than those operating telephone systems. This item amounts to \$139,029,837. When this is subtracted from the total given, there remains \$233,270,936 stocks and bonds outstanding. The stocks and bonds outstanding of the independent companies amount to \$114,760,122. The amount invested for each telephone is therefore \$190 per telephone, and that of the independent is \$120 per instrument. The difference is likely due to the extra investment for toll lines by the Bell company and also to water. Both of these figures seem to be unduly large. It is hardly likely that the average investment per line is nearly the amount given and the proper figure would not be much more than \$80.

The total income per telephone for all systems was \$37.50. It would be interesting to know just what influence the independent movement had on the great reduction in the total income per telephone. This reduction was very great, it being reduced from \$57.03, which amount prevailed before the days of competition.

The next time there is a general census of telephone statistics, the chances are that there will be much more accurate information available from the Independent bureau of publicity and then there will be an entirely different story to tell. A great deal of the information relative to the independent systems must have been approximate, for there are very few that keep some of the records reported. Those who had the work of accumulating the figures, no doubt, did the best that was possible with the materials available.

## Preliminary Program

### ANNUAL CONVENTION OF THE NATIONAL INTERSTATE TELEPHONE CONVENTION

Auditorium Hotel, Chicago, June 25-28th.

#### JUNE 25th.

10:00 A. M.—Meeting of Permanent Committee.  
1:30 P. M.—Meeting of Executive Council and Advisory Board.

#### JUNE 26th.

2:00 P. M.—Convention called to order.  
Address of Welcome:—Hon. Edward F. Dunne, Mayor of Chicago.  
Response:—E. H. Moulton, President, Twin City Telephone Company, Minneapolis, Minn.  
President's Annual Address:—Jas. B. Hoge, President, National-Interstate Telephone Association, Cleveland, Ohio.  
Officer's Report.  
Appointment of Committee.  
Question Box.

#### ADJOURN FOR THE DAY.

#### MORNING SESSION, JUNE 27th.

Meeting called to order at 10:00 A. M.  
Report of Entertainment Committee.  
Discussion of and Action by the Convention.  
Roll call of States.  
Paper:—"Official Organs—National and State," Chas. S. Norton, Secretary, Indiana Independent Telephone Ass'n, Indianapolis.  
Discussion.  
Paper:—"Look for the Shield", R. A. Walker, Gen'l Manager, Central Iowa Telephone Company, Iowa Falls, Iowa.  
Discussion.  
Paper:—"Telephone publicity—Appealing to public opinion", Mr. Ivy L. Lee, New York City.

#### ADJOURN FOR LUNCH.

#### AFTERNOON SESSION, JUNE 27th.

Meeting called to order at 2:00 P. M.  
Report of Committee on Standard Forms of Accounting.  
Discussion and action.  
Discussion.  
Address on the San Francisco Disaster by Mr. John Van Liew, President, California Independent Telephone Ass'n, Oakland, Cal.  
Report of Committee on Standardization of Equipment.  
Discussion and Action.  
Address:—"Southern toll lines and exchange development" by a representative from the Southern States.  
Question Box.

#### ADJOURN FOR THE DAY.

Informal Banquet, 8:30 P. M.—Col. J. D. Powers, Louisville, Ky., Toast Master.  
Speakers announced later.

#### MORNING SESSION, JUNE 28th.

Meeting called to order at 10:00 A. M.  
Report of Committee on Standard Operating Rules and Regulations.  
Discussion and Action.  
Paper:—"Suggestions 'How to finance small telephone properties,'" Theodore Gary, Vice President, National-Interstate Telephone Association, Macon, Mo.  
Discussion.  
Reports of outstanding Committees.  
Discussion and Action.  
Presentation of New Business.  
Question Box.

#### ADJOURN FOR LUNCH.

#### AFTERNOON SESSION, JUNE 28th.

Meeting called to order at 1:30 P. M.  
Transaction of unfinished business.

Report of Nomination Committee.  
Election of Officers.  
Installation of Officers.  
Farewell Address:—Speaker announced later.  
**CONVENTION ADJOURNS.**

## Partial List of Delegates Who Will Attend Interstate Convention.

### INDIANA.

#### DELEGATES.

M. E. Crow, Elkhart; Geo. W. Beers, Ft. Wayne; John L. Osborn, Veedersburg; A. L. Tetu, Indianapolis; Chas. S. Norton; Indianapolis; A. J. Payton, Rockport; A. C. Lindemuth, Richmond; F. R. Stickler, Franklin; Henry Barnhart, Rochester; F. M. Schirmeyer, Decatur; L. A. Frazee, Connersville; Jesse W. Weik, Greencastle; John A. Armstrong, New Albany, (P. O. Louisville, Ky.); E. Hawkins, Noblesville; Thos. D. Sheerin, Indianapolis; J. A. Browne, Winchester; J. G. H. Klinger, Brazil; Wm. L. Moellering, Ft. Wayne; Theodore Thorward, South Bend; Walter J. Uhl, Logansport; Harry S. New, Indianapolis; R. R. Faulkner, Newcastle; W. D. Curll, Petersburg; Chas. D. Knoefel, New Albany.

#### ALTERNATES.

Geo. T. Fox, Ft. Wayne; Frank White, Portland; H. O. Miller, Fairmount; J. F. Slinkard, Bloomfield; A. A. Adams, Columbia City; E. G. Van Busen, Michigan City; R. F. Blout, Wabash; Geo. C. Hitt, Indianapolis; B. H. Davis, Liberty.

### KANSAS.

#### DELEGATES.

W. H. Nelson, Smith Center; F. M. Pearl, Hiawatha, Kans.

### NEBRASKA.

#### DELEGATES.

F. H. Woods, Lincoln, Nebr.; T. E. Parmalle, Plattsmouth; T. H. Pollock, Plattsmouth; R. E. Mattison, Lincoln.

#### ALTERNATES.

N. A. Duff, Nebraska City; Warren Pratt, Kearney; W. J. Stadelman, Kearney.

### OREGON.

Chas. E. Summer, Portland, Ore.; Wm. Mead.

### OHIO.

E. L. Barber, Wauseon; J. S. Brailey, Jr., Toledo; Lewis Brucker, Mansfield; I. H. Thedieck, Sidney; J. C. F. Hull, Bucyrus; W. Gilbert Thompson, Hamilton; G. H. Metheany, Lima; W. W. Morrison, Toledo; J. B. Rhodes, Zanesville; G. P. Thorpe, Wilmington; J. B. Hoge, Cleveland; D. E. Sapp, Mt. Vernon; J. M. Saltzgaerber, Van Wert; F. L. Beam, Columbus; Cyrus Huling, Columbus; O. F. French, Cleveland; C. Y. McVey, Cleveland; G. R. Johnston, Columbus; W. F. Laubach, Akron; E. L. Coen, Vermillion; Leo. Flesh, Piqua; L. H. Beatty, Ravenna; Washington Hyde, Warren; H. P. Folsom, Circleville; J. C. Reber, Dayton.

Every delegate who cannot attend, is to select his own alternate.

### PENNSYLVANIA.

#### DELEGATES.

C. E. Wilson, Philadelphia; N. T. Folwell, Philadelphia; Jas. Collins Jones, Philadelphia; Chas. West, Allentown; C. W. Kline, Hazelton; Edw. Davis, Philadelphia; Richard Park, Philadelphia; F. D. Houck, Harrisburg; J. G. Splane, Pittsburgh; Frank Hart, Pittsburgh; W. H. Wilson, Erie; C. B. Rudy, York; W. L. Malin, Clearfield; James Griffith, Johnstown; R. E. Umbel, Uniontown.

#### ALTERNATES.

Any delegate who finds that it will be impossible for him to attend, is given the right of appointing as his alternate, some one from his district whom he knows to be going to the Convention.

### TEXAS.

#### DELEGATES.

J. B. Earle, Waco, Texas.

#### ALTERNATES.

E. W. Dunaway, Dallas; A. E. Shaffer, Waxahachie; Thos. O'Rourke, Shreveport, La.; C. A. Wilson, Granger; J. A. Murray, Ft. Worth; W. P. Johnson, Wills Point.

### WEST VIRGINIA.

#### DELEGATES.

W. C. Handlan, Wheeling; Lon H. Hutchinson, Huntington; A. C. Davis, Parkersburg; J. Walter Barnes.

#### ALTERNATES.

A. B. Kratz, Gallipolis, O.; E. K. Hertford, Charleston; L. H. Bowers, Pt. Pleasant.

### WISCONSIN.

#### DELEGATES.

J. C. Harper, Madison; J. M. Beer, Appleton; Phil Sheridan, Green Bay; R. Valentine, Janesville; W. F. Goodrich, La Crosse; J. B. Simmons, Racine; A. M. Webb, Ft. Atkinson; H. A. Moehlenpah, Clinton; Chas. Schornecker, Sun Prairie; J. C. Knone, Sauk City; Dr. G. N. Hinderhilde, Arcadia.

#### ALTERNATES.

Alfred Slater, Beloit; H. C. Winter, Madison; H. C. Willitz, Janesville; B. H. Wells, Milton; W. Van Middlesworth, Racine; A. M. Maxon, Milton Junction; A. S. Moore, Broadhead; J. C. Murdock, Broadhead; John Gaynor, Grand Rapids.

### IOWA.

#### DELEGATES.

Chas. C. Deering, Boone; F. C. Wesson, Atlantic.

#### ALTERNATES.

H. A. Kinney, Woodbine.

This is only a partial list; the others have not yet been selected.

## A STORY—NOT A FABLE.

BY A SUBSCRIBER.

### CHAPTER I.

This little story is not told because it is an unusual happening—whatever interest it may contain to the reader will be found in exactly the opposite direction. Dozens and probably hundreds, of Chicago people might tell a similar tale as a personal experience, and so, dear reader, if you live in Chicago perhaps it is your story I am telling as well as mine. The narrative has to do with a Suave Solicitor, representing a Great Corporation, and the Dear Public as personified by your humble servant. The aforesaid Solicitor called at my office some months ago in response to my letter to the Great Corporation. The Corporation referred to controls about 101 per cent. (more or less) of all the telephones in Chicago. I had written to its Contract Department, offering to add my name to its list of subscribers and craved the boon of having a telephone placed in my residence. The Solicitor gave me the choice of several attractive forms of contract and I finally selected a very crude little one about the size of a postal card, closely printed in pearl type, with much legal verbiage which bound the subscriber in a very cunning fashion and released the Great Corporation from all liability whatsoever. It may be said in passing that what I signed and what the Solicitor promised in his eloquent effort to secure the signature were two entirely different

and distinct propositions. In fact, the Solicitor was a very smooth young man and I, representing the Dear Public, did exactly as the Dear Public usually does in dealing with a Great Corporation.

## CHAPTER II.

In very little more than three weeks from that day the little contract began to bear fruit. The first fruit came in the guise of a young man who called to see if we really resided at the street number named in the contract and if we actually desired the use of the telephone. We assured him such was the fact and he retired very gracefully. In a few days, scarcely more than a week, two more men arrived and, after taking many careful measurements, departed. Six days later a man arrived with a horse and wagon, unloaded a telephone and trimmings, including a coil of wire, and he, too, departed as mysteriously as he came. Four more days—two men arrived and, after many hours of steady work, succeeded in placing the telephone as far as possible from where it would be convenient to the members of the household. Of course, this mistake was easily corrected in a few days, following many complaints and much red tape, and the telephone was finally installed and in working order.

The feverish haste from start to finish as described above was, no doubt, due to the fact that the Solicitor understood it was a "rush" order and promised to give it personal attention.

## CHAPTER III.

About this time the new telephone directory was issued but the subscriber was unable to find his name among those present. After some search the name was revealed but his own mother would not know it. The printer must have stuttered. The street number also was wrong, which added to the difficulty of identification and, incidentally, the telephone number also was incorrect in that two of the figures were transposed. These little discrepancies and difficulties were reported by the subscriber to the Great Corporation. Right here is where the subscriber made a Great Mistake for, be it known, it is a grievous blunder to point out the mistake of a Corporation—as President Roosevelt has recently discovered. We brought down upon our heads the full force of the wrath of corporate wealth. First came a red-headed man with an air of personal injury and a new contract to be signed. Having read the contract, I refused to sign it. He insisted that, inasmuch as the house number was wrong, the telephone number was incorrect and the subscriber's name was an alibi, it would be entirely necessary to have a new contract to make it "legal"—whatever that means. Just to be odd, I insisted on my refusal to sign, and he attempted to enforce the demand by a promise to cut off the service. He finally left my office with dire threats never to return. However, he went straight to my residence and secured the signature from Mrs. Subscriber, and put a new date on the contract. In the meantime we had decided to move. We therefore did not want a new contract nor did we want a phone at the old address. What we wanted was a new phone at a new address in another part of the city. However, here is the present situation as we now understand it. Mr. Subscriber is liable, under the old contract, for the old phone at the old address, the date of the first contract being November, 1905. Mrs. Subscriber is liable, under the second contract, for the same phone for one year from February 15, 1906, and both Mr. Subscriber and Mrs. Subscriber are liable for the new phone at the new address from April 1, 1906, to April 1, 1907. We are also in-

formed that the old contracts are not transferable to a new tenant of the house, but we have the privilege of being "released" by paying one-half of the amount of the unexpired contracts.

Sometimes we think that a telephone contract is not without its disadvantages. At any rate, if we outlive these, we will endeavor to struggle along without one. We for the U. S. Mails.

**IMPORTANT NOTICE TO DELEGATES AND OTHERS ATTENDING THE ANNUAL CONVENTION OF THE NATIONAL INTER-STATE TELEPHONE ASSOCIATION, AUDITORIUM HOTEL, CHICAGO, JUNE 26, 27 AND 28.**

Arrangements have been made with all railroads for reduced rates returning from the convention to all points from which one-way fare to Chicago is 75 cents or upwards, providing not less than 100 persons are in attendance who have complied with the following conditions:

Full fare, first class, through tickets to Chicago must be purchased not earlier than June 21st nor later than June 27th.

A standard form of certificate properly filled out and signed by the ticket agent must be secured at station where ticket is purchased. Agents issuing such certificates will request purchasers to sign same with ink in his presence.

If through tickets or certificates cannot be obtained at any station, agent will advise nearest junction point where same may be secured. Be sure to get a certificate. Agent's or conductor's receipts for fare paid, can not be accepted instead.

Upon arriving in Chicago, deposit certificates at the convention headquarters in the Auditorium Hotel with Mr. J. A. Harney, assistant secretary for his endorsement. When 100 or more have been so deposited, they will be vied by a special agent of the railroad who will be in attendance June 27th and 28th for this purpose, and who will collect a fee of 25 cents from persons presenting same for each certificate vied. Holders of certificates leaving before his arrival or before 100 certificates have been deposited with the assistant secretary, or who present certificates after the special agent's departure, cannot take advantage of reduced rates under this plan.

Ticket agents at Chicago will sell return trip tickets to starting points at one-third of the regular first-class fare, to each holder of a properly endorsed and vied certificate, providing such holder is the person to whom certificate was originally issued and whose signature appears on same. Neither certificates nor tickets secured under this arrangement are transferable, and for the purpose of identification, ticket agents at Chicago will request purchasers of return tickets to sign certificates in their presence. Tickets or certificates presented by unauthorized persons will be confiscated.

The association has guaranteed to redeem at regular tariff rates, all tickets secured under this plan which are misused or presented for sale.

The railroads request that all desiring to take advantage of the reduced rates, advise their respective ticket agents as far ahead as possible, so that through tickets and certificates may be prepared. They further request that same be called for not later than thirty minutes be-



fore departure of train, in order to avoid confusion at stations. If necessary, further particulars can be obtained from local ticket agents.

Please note the foregoing carefully. There will be several hundred people from all parts of the country attending the convention, but unless one hundred or more certificates are presented to the special agent, no reduction on any of them can be allowed, regardless of the number actually present. Every one attending the convention is therefore urged to secure certificates and observe all other necessary conditions, so that the association's plan for securing reduced rates may be successful.

### Texans Meet at Waco.

The Texas Independent Telephone Association met at Waco, Texas, April 26th. President Dunaway presided. The address of welcome was delivered by Homer D. Wade, secretary of the Business Men's Association, and was responded to by President Dunaway. Mayor Baker of Waco was introduced and spoke on the growth of the state and of the city. A letter was read from J.



J. C. CASLER, President Texas Ind. Tel. Ass'n.

B. Hoge, president of the National Interstate Association, calling attention to the coming National convention and to the importance of adopting the shield as the emblem of Independent telephony.

The following officers were elected: President J. C. Casler, Fort Worth; secretary and treasurer, C. A. Shock, Sherman; first vice president, C. W. Roberts,

Abilene; second vice-president, C. A. Wilson, Granger; third vice-president, Thos. O'Rourke, Shreveport.

Delegates and alternates were also elected to the national convention.

Among other things, the financial committee recommended the establishment of a clearing house association, and recommended that J. B. Earle establish a clearing house at Waco, and that he be paid \$100.00 a month for the first six months.

Various topics of interest were discussed, among them being the subject of advertising and it seemed to be the general opinion that Independent telephone companies should enter strongly into the advertising field.

The following committees were appointed by the president:

Executive committee—J. B. Earle, chairman; E. W. Dunaway, C. W. Roberts, C. A. Wilson, T. O'Rourke. Program committee—Aaron Smith, J. A. Murray, C. L. Simpson. Membership committee—Chas. F. Speed, chairman, Aaron Smith, G. D. Woodson, M. E. Martin, A. A. Marrs.

Moved by Mr. Shaffer that the next convention be held in Ft. Worth at the call of the executive committee. Carried.

### Southwestern Iowans Meet

Independent telephone interests of southwestern Iowa were well represented at Council Bluffs, Iowa, May 12, the occasion being a meeting of the Southwestern District of the Iowa Independent Telephone Association. No set program had been arranged and the meeting was quite informal.

In addition to a heart-to-heart talk on various topics directly connected with the subject of meeting competition those present at yesterday's meeting devoted some discussion to the clearing house question, as applied particularly to a division of terminal charges between the Independent Telephone Company of Council Bluffs and its connections. The adjustment of this matter, however, was left to the clearing house officials at Des Moines.

#### ANNUAL ELECTION OF OFFICERS.

A short business session was held for the election of officers and for the selection of a delegate and alternate to the national convention of independent companies, to be held at Chicago, June 27 and 29. The official list remains as before: President, H. A. Kinney, Woodbine; secretary-treasurer, J. F. Glenn, Denison. Fred C. Musson, of Atlantic, was named as delegate to the national convention, with H. A. Kinney, of Woodbine, as alternate.

Those present from outside of the district included P. C. Holdoegel, of Rockwell City, president of the state association, and Charles C. Deering, of Boone, the state secretary. The list of those in attendance follows: C. R. Benedict, D. C. Cooper, J. C. Mansfield, Shelby; A. J. Carter, Sioux City; H. A. Kinney, M. A. Reed, Woodbine; J. H. Jenks, M. Fretz, Avoca; E. C. Campbell, Persia; George Battey, Portsmouth; J. K. Alline, Chicago; George T. Hewes, Des Moines; W. H. Bryner, Vail; Phil Zerwas, Manning; P. J. Korth, Earling; C. H. Hallis, Hudson; George W. Sandy, Des Moines; C. H. Smith, Sioux City; J. F. Glen, Denison; P. C. Holdoegel, Rockwell City; Chas. C. Deering, Boone; J. F. Mouren, Arion.

# Hoosiers Convene at Indianapolis

The Indiana Independent Telephone Association held one of the most successful conventions in its history during the latter part of May. The meetings of the convention were held in the assembly rooms of the the Claypool hotel, which was beautifully decorated for the occasion. In the absence of President Beers the first session was presided over by Vice-President Theodore Thorward, of South Bend.

The report of the secretary included the minutes of the meeting held at Winona, Ind., nearly a year ago, describing the plan of organization there adopted; the secretary gave also a full history of the various district meetings held during the year and the results thereby accomplished in the Independent field. This report of Secretary Norton was so gratifying in character that it evoked hearty applause and produced a feeling of satisfaction throughout the convention. The executive committee, headed by Jesse W. Weik of Greencastle, made an equally satisfactory report.

The annual address of President Beers was read by A. C. Lindemuth of Richmond. Mr. Beers offered con-

properly supported, bring unqualified success to the Independent movement. President Beers urges all Independent companies to become allied with their local district associations, urged the adoption of standard and uniform rules, a standard sign and a uniform accounting system. After bestowing words of praise upon the officers under him and especially upon the secretary, the president thanked the association for its uniform support and for the honor done him and closed with a few well chosen words of cheer anent the general situation.

Theodore Thorward, vice-president of the first district, gave some statistics showing conclusively that the Independents have the Bell beaten in that district. There are seven Bell exchanges and 3,193 Bell 'phones in use in the district as against fifty exchanges and 17,295 telephones in operation by the Independents.

William L. Moellering, vice-president of the second district, said that the number of Bell phones there is so small as to be practically a negligible quantity. In some parts of the district there are no Bell telephones at all, but the entire district is well equipped with Independent telephones. Meetings are well attended and enthusiastic.



gratulations to the members of the association over its success during the year. He noted the increasing strength of Independent companies and their success in meeting the competition of the Bell. He warned Independent telephone men of the activity of the Bell interests in the country districts and urged that rural telephone men be fully informed as to the growth and purposes of Independent toll line companies in order that no one shall, through ignorance and fear of not being able to secure adequate toll connections, be induced to tie up with the Bell interests. He brought out strongly the absolute necessity for organization and pointed out that in the National Inter State Telephone Association all Independent Telephone men have an ally which will,

W. S. Uhl of Logansport, vice-president of the third district, reported that in his district there are 12,992 Independent telephones in service as against 4,103 Bell telephones. The Independents have joined the association liberally and others are coming in right along. The membership includes more than two-thirds of the entire number of Independent companies in the district, or, to quote figures, it represents 8,615 of the 12,992 Independent telephones in service. The district association also represents considerably more than one-half of the 1,595 circuit miles of toll lines in the district.

Other district vice-presidents presented satisfactory and encouraging reports. Prominent among these reports was that of Mr. W. D. Curll of Petersburg, who

stated that in the ninth district a complete organization including seven of the eight companies in the district had been effected. Several of the companies have merged with the Central Home Telephone Company of Louisville. Mr. Curll believed that the Independents at Evansville would soon secure a franchise, notwithstanding their initial defeat. He reported the Wabash Home Telephone Company, Monroe City, as having recently connected with the Central Union and asked that action be taken in the matter.

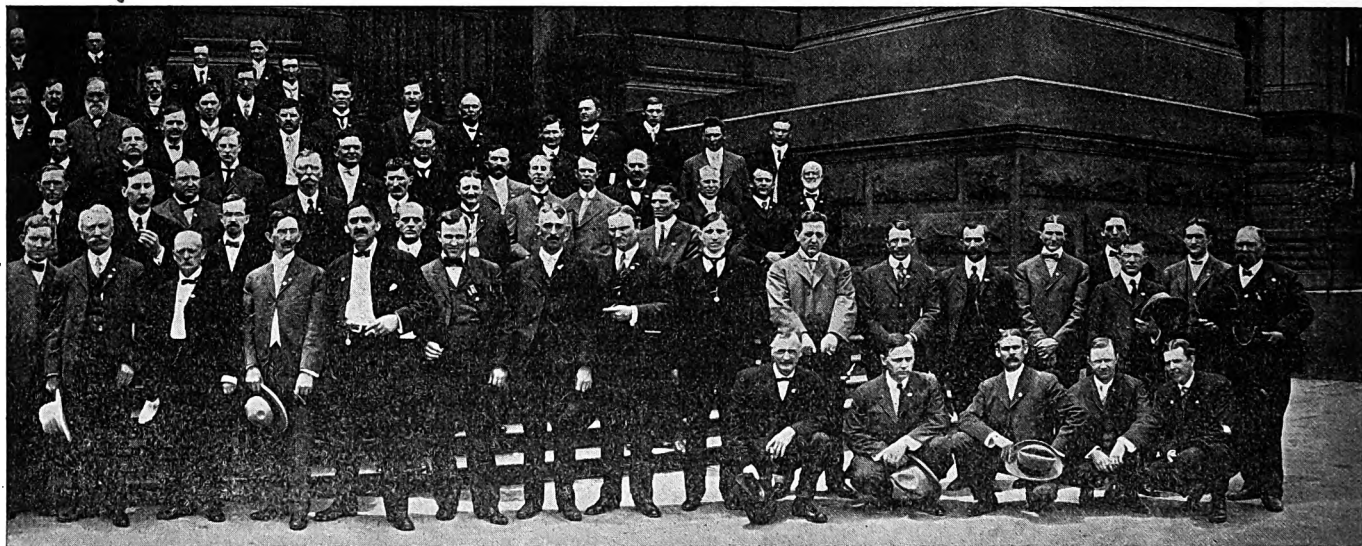
The evening session consisted of a smoker. Jesse W.

of Indianapolis urging favorable action on the application of the New Telephone Company for a modified franchise.

The committee on rates recommended the cutting out of free business and urged that measures be taken to educate the people in the knowledge that improved telephone methods cost money and that exchanges cannot be successfully run at former rates.

At the afternoon session the following officers were elected for the ensuing year:

President, A. C. Lindemuth, Richmond; secretary-



Weik of Greencastle, acted as toastmaster and the speakers included Theodore Thorward, South Bend; A. C. Lindemuth of Richmond; L. A. Frazee, Connersville; A. T. Payton, Huntingburg; Dr. R. F. Blount and others.

On the following morning the convention came to order at the command of President Beers, who had arrived in the meantime. After the dispatch of some routine business, Col. J. D. Powers' address on Independent Telephone Securities was read to an attentive audience by A. L. Tetu of Indianapolis. A vote of thanks was ordered sent to Col. Powers at Louisville for his excellent paper.

At the suggestion of the executive committee a petition will be sent to the mayor and board of public works

treasurer, C. S. Norton, Indianapolis; executive committee, Jesse W. Weik, Greencastle; Theodore Thorward, South Bend; Thomas Davidson, Greensburg; C. D. Knoefel, New Albany; W. L. Moellering, Fort Wayne.

The following were elected delegates to attend the National Interstate convention at Chicago this month: M. E. Vrow, Elkhart; Geo. W. Beers, Ft. Wayne; J. L. Osborne, Veedersburg; A. L. Tetu, C. S. Norton, Indianapolis; A. J. Payton, Rockport; A. A. Ulrey, Decatur; A. C. Lindemuth, Richmond; F. R. Strickler, Franklin; Henry Barnhart, Rochester; L. A. Frazee, Connersville; J. W. Weik, Greencastle; E. Hawkins, Noblesville. Alternates, Geo. T. Cox, Ft. Wayne, and Frank White, Cortland.

## Loyalty to the Principles of the Association

H. A. KINNEY

Upon hearing the results of the battle of Bunker Hill and learning with what bravery our heroic ancestors on that occasion faced the ranks of the British until then considered by the world as almost invincible, Washington is said to have declared that the liberties of the country were safe. Their intrepidity in battle, their willingness to endure hardships, their continued adherence to their country's cause through eight long years of strife, demonstrated the truth of Washington's declaration so far

as fighting qualities could demonstrate that the liberties of the country were safe.

But later historians do not now consider that the times of the revolution were the critical times in our early history. It is now believed that King George with his hired Hessians was not the worst enemy of the young republic, not yet the Red Men with all the plunder and pillage of which they were guilty. The greatest obstacle to their progress, the rock upon which they came nearest

suffering shipwreck, was their lack of united action, their failure to co-operate with each other, their fear of themselves. Separately, the two or three million human beings occupying our eastern border were thirteen feeble colonies neither feared nor respected by any. United, they were a nation of such strength and vigor that they commanded the respect and admiration of the world.

In view of these and other facts in our own national history, it ought not to be necessary for any one to come before this body of intelligent business men, and plead for greater loyalty to the principles of this association. It ought not to be necessary, but unfortunately it is necessary. With so many telephone companies unrepresented here today, with so little co-operation among those that are represented and less among those that are not, with the increasing demand all over the state for telephones and the increasing necessity for capital to supply this demand, we ought not to be obliged to come here and take time to discuss loyalty to the principles of the association.

We must have co-operation and arbitration or—Carrie Nation. We might just as well face this solemn fact. It will not be very long as the years go by until any man of sufficient vitality to prevent decomposition, can sit in his house or office and get himself into conversation with any other man similarly placed in the state of Iowa and not be very many minutes about it either. We are not living in the sixteenth century. It formerly took six months to get across the country but the invention of the locomotive made it possible to do the same in less than as many days. The invention of the telephone has made it possible to so arrange matters at a reasonable cost as to enable men to do as I have said, and they are going to demand that it be so. Any little seven by nine policy will not do. Somebody is going to do this work and whoever does it will reap the reward. We who are in the field must do it or we will be forced to step aside and let others with better notions of twentieth century ideals take our places; but it will be done.

The population of Iowa is reaching the two and one-half million point. When the point of saturation is reached there will be in the state in active service at the lowest calculation two hundred and fifty thousand telephones at a valuation of from ten to fifteen millions of dollars with a gross annual income running into the millions. The realization of these figures does not depend upon this association. It does not depend upon us individually. If this association should never have another meeting,—if we should all go out of the telephone business tomorrow, it would come just the same. It is possible for the people to have the service at a cost within their reach and they are going to have it. And, moreover, they are going to have it when matters get down to the normal condition without having two or three telephones apiece that will not connect with each other.

The present condition of the telephone business might be properly described as embryonic or perhaps chaotic, possibly idiotic would be better. This condition will do for the transition stage but not for the state of complete development. Either the Bell Company must retire or the Independent must go to the wall or there must be some sort of a compromise so that by having one instrument I can sit in my house or office and talk to any man in the state who has a phone and but one phone. It remains therefore for the Independent's endeavor alone to complete the task already begun and in order to do it successfully we must work as a unit. To do this we

must put an end to the miserable bickering and petty quarrels among ourselves. We must make an organized effort to establish toll lines in such a way as to cover the territory successfully and still not squander capital by building needless lines. We must work together in attempting to get the smaller, weaker and inexperienced companies to adopt better business methods, better construction to give better service. And this should be so whether they are members of the association or not. We can not play the dog in the manger policy. That has been tried and proved a failure else we wouldn't be in existence today. We need a campaign of education rather than of exclusion. We must work together in assisting each other in getting into forbidden ground.

There are as yet few cities in which the Independents have not gained a foothold, but as we in Western Iowa happen to know, there is yet one place which we need very much, and the assistance of the whole state is necessary in getting it. With a live association back of us, however, we would soon win out.

There is much talk of a clearing house to look after the money that comes in. But just at present more than we need to look after the money that comes in, do we need to look after the service that goes out. We need to strengthen the weak places, to fill up the gaps, to stand as a unit, and we will not need to worry but what the money will come in.

\*Paper presented at the Iowa convention.

## INDEPENDENT TELEPHONE FOR CHICAGO

The Manufacturers' Telephone Company of Chicago is the name of a company backed by the Illinois Manufacturers' Association, which has just applied for a telephone franchise in Chicago. The terms proposed are about one-third less than the figures the Chicago Telephone Company has submitted for an extension of its franchise. The amount of the capital stock of the new company has not yet been finally decided upon, but will doubtless approximate \$10,000,000. The directors for the first year are:

U. G. Orendorff, of the Parlin & Orendorff Company, agricultural implement manufacturers, Canton, Ill.; La Verne W. Noyes, president of the Aermotor Company, Chicago; John E. Wilder, of Wilder & Co., tanners, Chicago; John H. Pierce, president of the Big Creek Coal Company, Kewanee, Ill.; H. C. Staver, president of the Staver Carriage Works, Chicago; Samuel E. Bliss, of Bliss & Laughlin, steel manufacturers, Chicago; C. H. Smith, president Western Wheeled Scraper Company, Chicago and Aurora; Gustav Hessel, Jr., secretary and treasurer of the National Brewing Company, Chicago; John M. Glenn, secretary Illinois Manufacturers' Association, Chicago. The directors will choose a president, perhaps from among their own number.

The ordinance to be submitted to the mayor and city council is in preliminary form. As soon as the directors have passed upon it, it will be submitted to the council. One important feature will be to give all telephone companies the right to long distance connection with Chicago.

The new company, it is said, will have the support of every merchant in the city and state. Its purpose is to do a telephone business that will serve all the people. Chicago, they say, loses much trade by reason of its lack of Independent telephone connections, much business going to St. Louis and Kansas City by reason of their Independent telephone connections.



# Importance of Good Operating Service.

MISS T. BARNES.

How much is dependent on the service given in the operating room? Perhaps there is more than in any other department of a telephone company. Thousands and thousands of dollars are expended in installing a plant; when it is ready for operation, the greatest care should be taken in selecting operators. The operators are the demonstrators to the public of the quality of service to be given. Perhaps no one comes in closer daily contact with the subscriber than the operator. The telephone is the door to almost every business establishment and a very large per cent. of the residence portion of a city or town. If a poor operator stands between us and the doctor we are at her mercy in time of sudden sickness or accident.

**HOW TO MAKE A GOOD OPERATOR.** Some of the necessary qualifications are the following:—

A young woman who holds herself above every appearance of evil naturally has the welfare of her employer at heart:

Courtesy to her employers, to the patrons of the Company and to her co-operators.

To be able to make her employer's interest her own.

A soft, low, musical voice, for "A soft answer turneth away wrath."

When I interview an applicant for a position, if she brings satisfactory references, if she speaks in a courteous way of her last employer, and her voice is not deep or harsh, I usually consider her application.

The applicant who tells me all her troubles with her last employer, how she resigned without notice, etc., such applications I file away for future references to avoid a second interview.

**DISPOSITION.** Among forty girls, I find a great variety of dispositions. Someone has said "as easy to understand as a woman." I would be very much pleased to enjoy the gift of the insight of the author of this line.

**SOME OF THE DIFFERENT DISPOSITIONS.** The stubborn operator reports for duty in the morning, sometimes with a wooden expression on her face. She takes her seat, gives her board a wooden look and answers a few calls in a wooden way. We watch their moods as carefully as their work. We give her a phrase lesson making her use her sweetest tones before we consider her capable of answering another call. If she returns to her wooden manner, she must take another lesson. After she has received several pleasant responses from her subscribers, nine cases out of ten she is ashamed and lets the sunshine in her voice come through the clouds on her face and into her heart. "It is the heart and not the brain, that to the highest doth attain." We try to allow no discord to mar the harmony of a new day.

**THE SELFISH DISPOSITION.** The operator who signifies a willingness to work her regularly assigned hours as long as they do not conflict with her engagements, is found in almost every office. She rarely ever is accommodating enough to work overtime in case of sickness, although she frequently asks others to relieve her early on account of her engagements. If she feels indisposed she fails to report for duty. If her place cannot be supplied with a substitute, the operators on either side of her table must manage her work and their own. Such an operator is rarely liked by her co-operators and it is hard to supply a substitute for her. She expects each and

every rule to have a proviso to suit her particular case.

**THE OVER-SENSITIVE OPERATOR,** is the one who "carries a chip on her shoulder." She is always expecting some one to say or do something that is a reflection on her work. If attention is called to any particular rule that has been disregarded, generally she takes it as a personal censure. Her manner seems to say while she repeats her "Number, please, 'Well, what's the matter, am I too slow to suit you'?" If the party she is calling does not answer and the calling party signals her again, she opens the key, saying, "I'll ring them again." You hang up your receiver and go away, with the impression that you should have apologized before hanging up for the trouble you have made her.

**THE UNPUNCTUAL OPERATOR.** The operator who is not punctual, usually arrives after the second signal for forming in line to report in operating room, and frequently holds the line after the last signal until she removes her wraps. She very often is not present to hear any of the signals and has to come in alone after all of the operators are seated.

**THE GRUMBLER.**

There is always a grumbler in every office. She grumbles about her hours. Her chair is too high or too low. Her receiver is too sensitive or not sensitive enough. The room is too warm or not warm enough; too dark or too light. She grumbles while on duty and while in the retiring room. She comes like a cloud in a clear sky and won't let the sun shine because she does not like it. The operators, at lunch, laughing and talking over their new dresses, hats, engagements, etc., must pause while she relates her tale of woe and dissatisfaction. There is a feeling of relief when she does not remain for lunch.

The girl with the sunny disposition is not made. She is just natural. I realize that she will be an operator before she has had enough training to answer a call. She reports for duty with a smile on her face and says "good morning" in such a cheery way that you feel it will be a good morning for her rain or snow. She is careful, courteous and kind at her work and in the retiring room. She never carries her work away with her and never brings her outside affairs into the operating room.

She is full of life and laughter when she is off of duty. She takes up her work in a bright, quick, little way and the very lightness in her heart comes out in her voice.

She inspires confidence in those she is employed by and in the subscribers who come under her care.

It is easily seen that with such a variety of dispositions that a clash is inevitable at times. It is desirable that the subscriber shall be accustomed to uniform methods in dealing with the operators as it tends to prevent unnecessary conversation, and therefore tends to increase the uniformity and speed of operating. The quick tempered must confine herself to certain phrases consequently cannot cool her anger with spiteful little phrases of her own make-up.

The slow operator makes a much better showing if her responses are prepared for her beforehand.

Can we make the sun shine away the clouds always? Not always, but eternal vigilance has its reward.

# Solicitor vs. Chief Operator

BY F. B. CHESTER.

The assertion has been made that a solicitor is a superfluous quantity and that the chief operator is the all essential party to the increase in subscription list and development of a plant.

It is very true that a good and efficient chief operator is a valuable person, but only from a service viewpoint. He or she can do or undo the good work of the solicitor and management of a plant in a very short time, and therefore should be watched very closely and assisted at once at all times when assistance is needed.

The time has long since passed when in any business we can equip thoroughly and sit down and expect business to come to us unsolicited. We must go after it in the proper way and that way is by "Personal Solicitation" by a thoroughly up-to-date and reliable solicitor.

In the telephone business more than in any other public utility in existence, the business-getting end is the most essential before operating.

Advertising in circulars, notices and newspapers is a useless waste of money except in a city or town where opposition is most rife, and then the only advertising to do is to publish each day or once a week, a new and complete list of subscribers added since publication of last book, and in this way keep your present subscribers thoroughly posted, inform your prospective subscriber and advertise for your new subscribers, and a four-way benefit is derived as follows: 1st, your present subscriber is enlightened; 2nd, your prospective subscriber is set to thinking and subscribes because you have gotten Smith or Jones, etc.; 3rd, your new subscriber gets a free adv. in the paper and consequently works for you, and 4th, your company gains from all sides.

Don't advertise your service as the best, but have it so and your subscribers will do all the advertising you can take care of.

A solicitor is most valuable to a plant at the time it is built, but he must be honest in all his assertions and perfectly straightforward in all his dealings, for by him the

company is judged, and his proper interpretations of the company's operations and methods is the best help they can get from any source whatever.

The operation and method of getting business, of course vary a great deal on different plants. Take a small plant of about 1,000 ultimate growth and you cannot afford nor do you need a regular solicitor, but the manager should be of such a caliber to have his service the best and also do all soliciting personally except that done by his operators or troublemen.

On a plant of this size every one should work for new business and be remunerated for so doing by getting a certain amount of money for each contract secured. In this way everyone is interested all the time and makes success an assured thing. In a large plant of 2,000 and more, you should have a good solicitor to solicit and also make settlements of any controversy a subscriber may have. He should consult the manager and the two arrive at a good and just solution of the matter in hand, and he (the solicitor) see the subscriber and settle the case.

The solicitor is most needed, of course, when a plant is building, to insure the company against failure to have subscribers to start.

We can no longer take a man's word for it, but must have a contract with his signature so he won't change his mind.

My experiences have been that "a burned child dreads the fire," and people are most generally afraid of things that look so good, and expect a good thing to be pushed along incessantly with all the steam you can get up.

Don't lead a man to expect more than he will get, for it is the wise man who can so paint the future that the realization is beyond the expectation, as it is so often vice versa.

If you get a solicitor you will have to pay him a good salary, and by all means do so for a cheap man is the worst thing you can get hold off.

## Rural Co-operative Telephone Exchange

BY H. H. HUTCHINS, Manager.

The Saugatuck and Ganges Telephone Company, (Ltd.) of Fennville, Mich., was started by a few fruit growers combining with local steamboat men for the erection of lines reaching into the fruit sections from shipping points, in 1895. About two dozen telephones were first installed, each subscriber paying the entire cost of his connection. It soon became necessary that we associate ourselves and elect officers for the management of the little system, which was done in 1896. A provision in the by-laws was that each subscriber pay for all material required for the maintenance of his 'phone and that

each share his pro-rata portion of the cost of maintenance and operation of the plant.

It has since been arranged that where several desire to connect to our centrals by party line the company will run the wire to the vicinity and allow the subscriber to connect thereto free of line charge.

All supplies and instruments are furnished at actual cost and the work is done by experts in the employ of the management at as low a rate as possible, looking forward to the benefits to be derived from the ability to reach as many as possible of the members of the community.

The system is purely co-operative and no dividends accrue, only sufficient charges being made to cover maintenance and operation.

Officers are elected from among the shareholders annually, which places control in the hands of people who have no object in the matter other than efficient service at as reasonable a figure as possible.

The growth and efficiency of the enterprise are too well known here to call for comment, and to extend thanks to any one would be merely self-congratulation, since it is the outgrowth of an enterprising community who operate it according to their own liking, through managers elected annually from among their own number, and who are residents of the community.

#### SOME AMUSING EXPERIENCES.

When the little plant was first started no one knew anything about telephone matters and but very few in the community had ever talked over a wire. Accordingly the general impression was given out that there would be no cost after installation. Switchboards were placed in stores and business places at the five centers, Saugatuck, Douglas, Ganges, Fennville and Glenn. The attendants agreed to do the switching for nothing, it would be fine sport, and the instruments were supposed to be as free from trouble as the piano in the parlor or the colt in the pasture. The first lot of telephones were installed by the aid of a local telegraph operator, and an expert from the factory set the switchboards. Things ran smoothly during the fall of 1895 and the following winter, but in the spring of 1896 a dark cloud, accompanied by a severe electric storm, rolled up over old Lake Michigan and, well, any telephone man knows the rest.

By this time our attendants began to think it best to answer telephone calls when they could not sell goods, so the subscribers grumbled because their calls were not properly attended to. At the same time the fellow who had been obliged to leave his business to "see if he could find" the trouble with the 'phone, began to "sit up and take notice also."

Another important matter developed at about this time—that of having a head and a tail to this thing. There was no one who had authority over it and it was running wild, so a meeting of those who had donated to the enterprise was called and it was decided to organize. Three bright fellows were chosen to draft a set of by-laws. This, being of minor importance, only delayed the meeting twenty or thirty minutes, but we appreciated the fact by this time that there must be some expense attached, so a clause was inserted providing for a pro rata charge for maintenance and operation, as mentioned above. After providing that all matters should be referred to the share-holders for final disposition, the articles were adopted and we proceeded to elect a board of managers.

One of the first observations of the new board was that we would be under the necessity of paying our attendants a stipulated sum, and that we must employ an expert to look after trifling matters which seemed to creep in to disturb the perfect working of the instruments, so an assessment of \$2.50 was levied for a sufficient amount to settle all accounts to date. Things ran on in a hit and miss way until January, 1898. By this time our assessments had amounted to about \$9.00 per year for the two and a half years we had been running. This was considered exorbitant and there were rumblings of distrust to be heard from the members, and as the board of directors were serving gratuitously they decided to let the honors of office fall upon other members, so an entire new

management was elected. Just previous to this meeting, however, the manager had a new code of by-laws carefully drawn up and signed by  $\frac{3}{4}$  of the stock, to become operative at once, so that the new board-to-be might not be hampered as the old one was, by having to refer every important transaction to the share-holders.

At this time there was a deficit of about \$300 and it was decided to place the business on the basis of annual rental of \$12, payable quarterly. This sum was supposed to clear the indebtedness and allow the board sufficient funds with which to run the plant and clear up all accounts. It would doubtless have met all expectations had not the fact developed that many of the pole lines were already overloaded, and more wires waiting to be strung, so much work had to be done, and expense for material had to be met, and at the end of the second year of the new management we were about \$700 deeper in the hole than when they took the reins of government. They were all good business men in their own line, and strictly honorable, so our little community settled down to the conclusion that it took money to run a little telephone plant as well as any other enterprise, and they voted it to be the sense of the meeting of share-holders that the board place the rental at \$15 per year, which was done immediately by the new board, and we have dropped out of the fence corner gossip.

At the \$15 annual rental we have practically cleared our indebtedness, that is, we have sufficient amounts now due to finish doing so, and have added many improvements in the meantime. Our expense account has been swelled in the work of correcting errors in first construction, and in re-construction made necessary by over-growth.

Our principal advantage in co-operative ownership lies in our peculiar situation. This being a fruit growing section it is important that our subscribers, who are mostly fruit-growers, have free access to all the local marketing points, since much of their output is sold at the surrounding stations, and telephone connection with but one of the stations would be of little advantage, while a toll rate would become burdensome. As our company is mostly made up of fruit growers, we can, by this plan, allow ourselves the use of the entire system by paying a sufficient rental to maintain the plant, while an outside company would be obliged to charge toll between stations for interest on the investment.

In our five exchanges we have about 200 subscribers in winter and 250 in the summer months, or an average of about 50 to each exchange when all are working. Our rates are \$2.00 per month for three months, \$1.75 for six months, \$1.50 for nine months and \$1.25 for annual rental.

By the friendly toleration of the large companies who control the long-distance lines passing our section, we are enabled to reach outside points over their wires and at the same time maintain our local institution.

Were it not for our peculiar conditions, our perishable crops and the consequent necessity for free access to our surrounding shipping points, both by rail and water, I could see no advantage in co-operative ownership and management.

We have mostly single grounded lines and naturally are subject to the usual amount of cross-talk under such conditions, but as the majority of the subscribers own their own line to the central, they are satisfied with the conditions and see no need for further expense in doubling the wires.

## Independent Activity in the South

Very little detail of the work of the Independents in the South has been known, owing to the lack of due appreciation of publicity in that section of the country in this connection.

Few people know that within a very short time long distance connection will be possible, under very best conditions, with the South, as far as Birmingham, Alabama, and soon thereafter clear to the Gulf at Mobile, Ala.

But little over a year ago a Long Distance Telephone & Telegraph Company was organized in Alabama, for the purpose of building telephone long distance lines from Mobile via Birmingham north to Bowling Green and Hopkinsville, Ky., where connection would be made with long distance lines now operated, thus completing the connection with all the large Independent Long Distance systems now operated in Kentucky, Ohio, Indiana, Illinois, Missouri, etc., etc. Coincident with the building of this large system a number of new local systems have already been built and many more are in course of construction and a great many are projected in Alabama and Tennessee. The people in those states are beginning to awaken to the great advantage to be gained by the extension of Independent telephone service.

The lines of the Long Distance Telephone & Telegraph Company now in course of construction and almost completed to Birmingham, are without exception, the most efficiently constructed of any that have heretofore been built by either Independents or the Bell Co. They are equipped with Nos. 6, 8 and 10 copper wire and in all respects are the highest type of telephone construction.

The pole line is complete and the work of completing the stringing of the wire is now in progress.

There are already in service about two hundred miles of line, being in various sections.

The construction of these lines precipitated the bitterest fight with the Bell interests that has ever yet been encountered.

The Bell Co. resorted to every means, legal, or otherwise of the most dastardly character and with the usual reckless expenditure of money, without conscience. They employed an army of lawyers of indifferent ability, to whom the ethics of their profession is unknown, or at least for which they have no regard, and these alleged lawyers occupy their time in riding along the line, as near as they could forecast it, urging property owners to bring damage suits and injunctions and use their utmost endeavors to get all the towns and villages to be passed through to deny the new company the right to pass through them. That they succeeded in annoying is of course apparent, but so far these tactics have not been successful in a single instance and as is usual in such disreputable practices, the perpetrator usually overreaches himself, which, in this case resulted in some of these maintained cases going to the Supreme Court, where the question never before decided was clearly put before that tribunal and it has just rendered its decision which effect-

ually settles for all time the rights of Telephone Companies to the highways, as the Court holds that the telephone companies have that right and that the abutting property owner is not entitled to any compensation for such use of the highway by the telephone company.

It would be impossible, in any reasonable amount of space to fully explain the contemptible and underhanded methods used by the old monopoly company in the states of Tennessee and Alabama in their frenzied effort to kill the competition of these long distance lines in which they correctly recognize the entire destruction of their heretofore well established GRAFT and undisturbed enjoyment of their practice of the gentle art of bleeding the public.

Incidental to the construction of this Long Distance system, has been the well-known fight in the city of Nashville, in which the monopoly used vast sums of money in corruption, together with their full force of "Yellow Dogs" to prevent a local plant being built in Nashville or any long distance lines entering that sacred city. This question is still in the courts, but pending that decision the long distance lines have been constructed through the heart of Nashville and a small switchboard and various toll stations have been established, and now are in operation. That a complete local system will be built, there is no doubt.

Connecting with the lines of the Long Distance Telephone & Telegraph Company and closely associated therewith, are the lines now under construction in the state of Kentucky, by the Central Home Telephone Company. This latter company has its lines completed from Henderson, Ky., to Clarksville, Tenn., passing through Madisonville and Hopkinsville and at Clarksville connects with the lines south to Birmingham. It also has its lines completed from Bowling Green, Ky., south to a connection with the lines of the Long Distance Telephone & Telegraph Company; it has under construction lines from Bowling Green westward through Russellville, Hopkinsville and Paducah and to Cairo, where a connection will be made for St. Louis and the West. It is also constructing a line from a connection with Louisville, east through Lexington, Paris and Mayesville to Portsmouth, Ohio, where connection will be made with the lines of the U. S. Telephone Company.

These lines, in connection with those already operated will greatly develop the Independent Long Distance service and largely increase its usefulness.

The business conditions attendant upon the long distance service in the South differ somewhat from those obtained in the North and Central states, viz: The cotton business in all the states producing it is handled almost exclusively by telephone, where connection is available, and in the tobacco-producing centers a large portion of this commodity is marketed by telephone. Therefore, the volume of business per capita of population is greater than in any other section. It is, therefore, easy to understand why local telephone systems in the southern cities have not sprung up so thickly as they do in the Central states, as in the South long distance connections are almost indispensable, while in the Central and Northern states it is possible to maintain a local exchange without long distance service and make it successful.



# Right of Territory.

A. C. DAVIS.

No department of the Independent telephone business in West Virginia needs the attention of the convention more than that of our rights of territory. The subject necessarily involves many conditions and subdivisions.

We might trace the rights of territory from the days of the wandering tribes of Israel, and from the King's chartered territorial grants down to the present day without throwing light on the subject as it effects Independent telephony. The subject will be dealt with as it effects the Independent telephone movement in West Virginia.

Years ago the Bell Telephone Company possessed the whole territory of the United States and Canada, but did not develop or occupy it. The large cities, towns and villages only were developed. Protected by patents of questionable issue it became arrogant, selfish, dominant and grew corpulent on the money filched from the public by extortion. The demands of the public for telephone service were not heeded.

Deprived of the greatest convenience of modern civilization the people began to erect and build telephone lines and occupy the territory not developed by the Bell Telephone Company. Not until the Independent movement set in in earnest did the Bell company make any attempt to develop the unoccupied rural territory, and not until two million telephones were installed by Independent companies in the United States did the Bell company wake up. It still hears the echo from every city, town and village in the state of West Virginia.

Since the Independent movement began in the state of West Virginia it has been an unwritten law that unoccupied territory belonged to the company first on the ground, or first to make developments in the territory. It has many times occurred that the first company claimed possession of territory, or right of territory, it did not develop. The company occupying adjoining territory frequently built over into territory claimed by the other; thus bringing about dissatisfaction and contention as to rights of territory. It may, therefore, be said that a company occupying a city, town or county should have the right to keep and develop the adjacent territory. Failing to develop it should forfeit the right to occupy it. Which then from among the many neighboring companies should develop it? The answer is: the one which can best serve the community.

Wholly unoccupied territory is, and should be considered, open territory and the first to make developments should by right keep it, but the first company entering territory does not always find itself in position to develop it or to serve the community. The territory may be isolated from its headquarters, or it may happen that the general trend of trade and commerce is not in line with its developments, but in an opposite direction, and that the community can be better served by the second company. Thus it occurs that the second company is induced to build into the same territory, and competition and rivalry immediately begin between the two companies.

Now don't deceive yourselves by this useless competition; there is not room enough or business enough in any town or community for two Independent telephone

companies. Do you ask how these conditions can be solved? The solution is: divide up all territory occupied by two independent companies; let the division give to each the territory that it can best serve. If the companies interested cannot agree let them select arbitrators whose action shall be final—compensating the company losing the territory as may be agreed upon.

The Independent movement is of the people and for the people. They must stand together forming a coalition and union that cannot be shaken by the common enemy of Independent telephony. There is territory enough for you all and your rights to keep and develop it are safeguarded and protected by this association. You have no rights of territory that the Bell company respects, yet it is remarkable what they are now offering Independents in the way of sublicense contracts, and other schemes to make a breach in your territory.

Diverting a little from the subject I want to pay my respects to the "Parasites" that are preying upon the territory of the Independents in this State. These human vultures are not engaged in telephone business for profit, but are like vermin infesting your household, spreading disease, discord and strife. Like a serpent they creep upon your territory in the night time, and with the sting of an adder strike at the vitals of your business. They are sometimes the offspring of the Bell Telephone Company, created to harass the Independents, and, by the use of certain subsidized Bell equipment are given long distance connection; sometimes they are the creation of disreputable manufacturers; sometimes they are born of strife and dissension among the Independents themselves over divisions of territory.

No reflection is cast on any reputable manufacturer represented at this meeting. But, nevertheless, it is true that certain disreputable manufacturers keep a "shyster" or "booster," in the field organizing mutual lines in opposition to the Independents, it does not matter to him in whose territory he operates, that does not concern him; he is after the sale of a few telephones, and on and on he goes organizing section after section and division on farm lines, promising connection with the local company in the territory of which he is building. Perhaps after doing the local company all the damage possible and seeing the sale of his telephones cut off unless the promised contract is procured, this same "shyster" approaches the local manager for a contract for his ill begotten offspring.

Beware of this viper! These illegitimate offsprings have no place in the West Virginia Independent Telephone Association. To protect the territorial rights of its members article No. 12 of the constitution was adopted, which is as follows:

"No company, firm, corporation or individual engaged in telephone business in opposition to any member of this association shall be eligible to membership in this association, without the written consent of the member in whose territory said company may be operating. A member of the association shall not connect with or receive toll traffic from any company, firm, corporation or individual engaged in toll traffic in competition to other members with which said company competes. A member violating this article shall be excluded from

membership in this association or dealt with in such manner as may seem proper by the executive committee, or the association in annual session."

Let the old line companies stand together, shoulder to shoulder; let the spirit of give and take control your actions as to disputed territory. If for any cause you cannot develop the territory properly belonging to you, encourage the organization of a local company to develop it, giving a fair contract for connection with your exchange.

If you cannot interest local people to develop it, then arrange with your neighboring company to build the territory on a mutual contract for switching subscribers and the exchange of traffic. Be fair and honest with each other in the division of territory; protect your neighbor in all contracts for traffic connection and all contentions as to rights of territory will solve themselves. Encourage the occupying and development of new territory. Do not refuse to develop territory and then object when your neighbor does attempt to develop it.

There is yet much undeveloped territory in the state of West Virginia. Some of it very valuable and productive; some of the mountain districts are sparsely settled and will not be productive for years, if ever. These sections of the state have been isolated from the larger operating companies; thus the territory has not been developed to any great extent.

The smaller companies have not, for financial reasons, been able to develop it. Not only this but this part of the state is cursed with a Judas who has a mania of sub-license Bell contracts. The Bluefield territory in the southern part of the state and the Eastern Panhandle

have especially suffered in the loss of territory. Our weak-kneed neighbors are like a few men found in every community—poor souls, can't help it—they betray their fellows for a few pieces of filthy lucre. Turn the lights on and you see them as they are. They leave your community to buy their goods; invest their earnings in foreign securities, and go to the Bell-ridden city of baked beans for their telephone service.

Rid the business of them! When the business is backed by men who are true to the cause you will see every inch of unoccupied territory in the state of West Virginia fully developed, and a business established that cannot be taken by a gigantic corporation which seeks, not by fair and honest competition, to destroy your business, but by falsehood, misrepresentation, and the power of wealth, to crush it.

Gentlemen, your state organization is backed by men who have devoted years of their lives to the business—men who have been tried and found true. The affairs of the Independents of the state of West Virginia will be nurtured and protected by them. Have faith and confidence in your fellow associates in the development of your native state. Push! push! keep pushing! United we conquer; and, guided by the hand of past experience, Independent telephony will ride the rough waves of opposition; steer off of the stormy capes of financial disaster, and enter a non-Bell port of commercial peace and prosperity where the rights of territory do not disturb us.

[Paper read before West Virginia Independent Telephone Association, Parkersburg, W. Va., February 23, 1906.]

## Legal Notes.

MERTON J. KEYS, ST. LOUIS, MO.

### Refusal to Receive and Transmit Message.

D. S. Pollard brought an action against the Missouri & Kansas Telephone Company to recover a penalty of \$200, under the terms of section 1255, Rev. St. 1899, relating to the duties of telegraph and telephone companies. The company demurred to the plaintiff's petition, on the ground that it did not state a cause of action. This was sustained in the Caldwell county circuit court, and electing to stand on his pleading, plaintiff carried the case to the Kansas City court of appeals.

The opinion of this court, affirming the judgment rendered in the lower court, discussing as it does the meaning of the statute and its applicability to telephone companies, is of sufficient importance to be quoted in full:

"The petition charges that defendant had a telephone line open to the public running from Braymer, Mo., to Kansas City, and that it maintained offices at each of those places. The plaintiff proceeds to state his case in these words: 'Plaintiff further states that, under the provisions of section 1255 of the Revised Statutes of Missouri for 1899, it was at the date hereinafter mentioned the duty of the defendant to promptly, and with impartiality and good faith, furnish telephone service over its said telephone system, and to transmit dispatches for all persons who may pay or tender the usual fees and charges as are prescribed by the defendant for

such service, and for the transmission of such dispatches as is requested and demanded. Plaintiff further states that on the 10th of June, 1904, at the office of the defendant, in the said city of Braymer, he informed the defendant's agent in charge of said office that he desired to communicate with F. E. Pratt, at Kansas City, Mo., and requested and demanded of defendant's said agent that he be placed in communication with said Pratt over defendant's said telephone system; that the usual charge and toll for the service demanded by the defendant was forty-five cents; that plaintiff offered to defendant's said agent at the time a fifty-cent piece of money from which to take the proper amount of tolls and charges, which amount was more than the usual charge for the service demanded by plaintiff; that defendant, by its agent, then and there refused to accept the amount offered, and refused to receive any money from plaintiff, and wrongfully refused to receive any money from plaintiff, and wrongfully demanded by plaintiff, and informed plaintiff that the correct amount of tolls would not be received if tendered.' It then stated 'that by defendant's refusal to furnish plaintiff with the telephone service demanded, it violated its duty, as prescribed in said section 1255, whereby it became liable to pay a penalty of \$200,' for which judgment was prayed.

"The statute referred to is as follows: 'Duties and Obligations of Company.—It shall be the duty of every telegraph or telephone company, incorporated or unincorporated, operating any telephone or telegraph line in

this state, to provide sufficient facilities at all its offices for the dispatch of the business of the public, to receive dispatches from and for other telephone or telegraph lines, and from or for any individual, and on payment or tender of their usual charges for transmitting dispatches as established by the rules and regulations of such telephone or telegraph line, to transmit the same promptly and with impartiality and good faith, under a penalty of two hundred dollars for every neglect or refusal so to do, to be recovered, with costs of suit, by civil action, by the person or persons or company sending or desiring to send such dispatch, one-half the amount recovered to be retained by the plaintiff, and one-half to be paid into the county public school fund in the county in which the suit was instituted; and the burden of proof shall be upon the company to show that the wire was engaged as the reason for the delay in transmitting such dispatch.' Rev. St. 1889, section 2725. The statute originally applied only to telegraph companies. Section 9, p. 349, Rev. St. 1865. In the revision of 1879 (section 883) it is so amended as to couple telephone with telegraph companies. In the revision of 1889 (section 2725) it is further amended by adding the duty of such companies 'to provide sufficient facilities at all its offices for the dispatch of the business of the public.' The section as thus amended was incorporated into the revision of 1889, as above quoted.

"It will be observed that the plaintiff does not charge that he tendered a dispatch to defendant's agent at Braymer, which he asked to be transmitted to a person in Kansas City. It charges that he 'demanded of defendant's agent that he be placed in communication with said Pratt over defendant's telephone system.' Manifestly, he desired to communicate by conversation directly between himself and Pratt. This was denied him, and for such wrongful denial he might have his action for damages if any were sustained; but he has no claim to the penalty prescribed by the statute. The statute is penal, and should not receive a strained construction. The defendant must be brought strictly within the terms prescribed for a violation of which the penalty is imposed. The duty imposed on the defendant is to provide facilities at its offices for the conduct of business with the public, to receive dispatches from and for other telephone lines, and from and for any individual, and, with such dispatch is received, to transmit it promptly, under a penalty of \$200 for failure to do so. The defendant is not charged to be guilty of any of the things which the statute requires of it. It is not charged that it lacked facilities at its office for conducting its business, nor is it charged that it refused to receive or transmit a dispatch; indeed, a dispatch was not offered to its agent to send. The defendant is in no way brought within the terms of the statute, and consequently was rightly discharged by the trial court.

"It is doubtless the duty of an agent of a telephone company to receive at its office a dispatch properly addressed and paid for, and to transmit such dispatch by the voice over its wire to the addressee. But the dispatch means a written dispatch delivered by the sender to the agent of the company. This can be clearly seen by the provisions immediately following section 1255. Thus, in section 1257, it is made the duty of the company's agent, when the line is out of order, to inform the sender, and, if required, to write that information on the dispatch. Provision is made in section 1258 against forging dispatches, and so, also, section 1259 clearly shows a

written dispatch is meant, for there reference is made to copying and addressing dispatches."

### Dramatic Forecast Made Years Ago

A dramatic forecast was made before the supreme court at Washington during the great lawsuit over the Bell patents nearly twenty years ago:

"If this court finds in favor of the American Bell Telephone company, it will enable these plaintiffs to perpetuate the fruits of this fraud for many years, and to fasten on the necks of the American people a gouging monopoly, from which there will be no escape, even after this patent has expired; for, by that time, this corporation will have so wound its tentacles about the community that only an uprising of the people, such as is not conceivable, will be powerful enough to shake it off."

The court did find in favor of the Bell Telephone company, and the effect of this finding was truly according to the prophecy. It fastened "a gouging monopoly" on the necks of the American people. But there stopped the foresight of the eloquent lawyer. The "uprising of the people," which he deemed inconceivable, has come to pass. The telephone monopoly has been shaken off. In spots, here and there, it still holds control; but, in the nation as a whole, it has been worsted. Today it operates approximately two and one-half million telephones, while the people (for the opposition companies are truly the people, and therein lies their strength), have approximately three million.

There are over 6,000 separate independent operating companies, with something like 300,000 stockholders. Thousands of these companies are run on the mutual or co-operative plan, every subscriber being a stockholder. In many communities, the Independent telephones outnumber the Bell six to one. In some, the ratio is as high as ten to one. The average where the Independents have a fair foothold, is easily three to one. That the national average is not higher is due to the fact that in many of the larger cities (especially in the East, where the Bell instruments are most numerous), the Independents are only beginning to get into action. In New York city, for example, the Bell has over 170,000 telephones. No Independents company has succeeded, so far, in getting into the city, owing to the political protection the telephone trust has always enjoyed there. But now the Independent forces are knocking at the gates of the metropolis with a \$50,000,000 corporation. They have unearthed a franchise which, some of the best lawyers in the country declare, will compel equal rights with the Bell, and they promise to have 225,000 telephones in operation on Manhattan Island inside of three years.

It will be tremendous work, this attack on the metropolis, for the Bell company will fight here to the last ditch. New York is the keystone to its business arch. When this keystone is destroyed or crumbled by competition, the whole arch will tremble. Hence the Bell people have made Manhattan Island their Gibraltar. Its defense will be a spectacle well worth watching. It will probably show us the greatest industrial battle of the age. —Success Magazine.

# A Study in Induction Coils

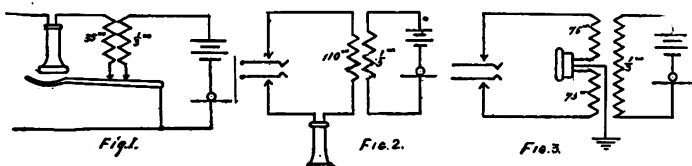
J. C. KELSEY

The size of a wire determines the amount of current which can flow in, through and about it. If one is to deliver electrical current to a distance at a certain loss, the wire has to be a certain size.

The old Edison three wire one hundred and ten volt system did not distribute power very far from the central station, owing to the huge amount of copper required to do it.

The first alternating current lighting systems employed 1000 volts, and made use of step down transformers, in order to place a safe potential in human habitations. One thousand volts made it easier to distribute, as one-tenth of the current flowed, but made faraway customers possible, and cut down the amount of copper.

The power distribution business has grown to such an



extent that economy in first cost has demanded a pressure as high as 60000 volts. But this is only a line pressure, as the generating machines do not exceed five or six thousand volts. Therefore, step up transformers are required.

Having one source of power, at a certain pressure, the various demands made upon it, require both a step up and a step down transformer. The transformer on the pole near your house is a step down transformer, and probably, a twenty to one ratio, reducing the generator potential from 2000 volts to 100 volts. The transformers, so carefully guarded at the interurban substations, are step down transformers, and lower the line potential from 40000 to 370 volts, in order to make the direct current side of the rotary converter give out 550 volts. At the power house, the transformers are of the step up type, and raise the normal generator pressure of 2000 volts to 40000.

If the 2000 volt circuit delivers one hundred amperes to the primary circuit of the forty thousand volt transformer, it can be said that the secondary side is delivering five amperes. The watts of the primary are equal to the watts in the secondary circuit. If the 2000 volt circuit is delivering one ampere to the primary of the 100 volt house transformer, it can be said that the secondary circuit is delivering twenty amperes. In this case, twenty times one hundred is equal to 2000 times one.

A telephone induction coil is the transformer of the telephone system. By its aid, the three volt dry battery and the transmitter deliver to the line circuit an alternating current. Normally, an undulating current flows in the primary circuit, but it becomes an alternating current in the secondary side.

Normally, a telephone transmission looks like a long distance power transmission. By means of an induction coil, it looks as if the low potential of the primary circuit is transformed to a higher line pressure, so that resistances are more easily overcome.

The regulation of a power transformer depends for one thing upon the ability of the source of energy to sus-

tain the demands of the secondary circuit. For instance, if one has a twenty-five horse-power transformer, and a corresponding load, it would be impossible to deliver the power from a ten horse-power source, because the pressure of the secondary line circuit would fall so low in adjusting itself to the external load conditions that it would fail to deliver any current. Therefore, if the source is in excess of the required output of a transformer, the pressure demands of the secondary are satisfied, and proper work is done. Regulation is either manual or automatic. Anyway, the conditions are adjustable.

A telephone circuit resembles a constant transformer condition. As the line resistance increases, it looks as if the pressure of the secondary should rise in proportion, and take care of the increased resistance. But the induction coil is not a constant current transformer, and there is no means of regulation. The conditions are the same, whatever the external load. When the load or resistance becomes too great, the secondary pressure in adjusting itself to conditions, falls so low as to become zero at certain points.

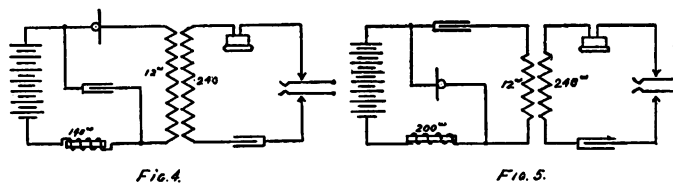
Therefore, if you wind an induction coil, one to one, in induction coils. There is no regulation possible, and if there is a tendency to raise the potential, the tendency to adjust itself to line conditions completely eliminates the ratio idea.

Therefore, if you wind an induction coil, one to one, or ten to one, and put it into use on your line, there will be no difference in your secondary pressure. If it did, the operator's transmitter circuit would be the best in the house. It usually is the poorest. It has a higher ratio of turns than the subscribers' coil, but it availeth not.

It then makes no difference which side of a repeating coil you put on the line side. The old Bell No. 8 repeating coil had a ratio of three to two, and I was taught at least to put the high side next to the line. I never could detect the least difference, whichever the line side.

The induction coil is wound with low resistance, something like one-third of an ohm, with three hundred turns. For subscriber work, the ratio of transformation is about nine to one.

Consider a local battery set. The transmitter of some manufacturing companies runs as high as sixty ohms.



The dry cells have a resistance of a half ohm, while the primary may have an apparent resistance of one-half an ohm, too. The drop of potential, which acts on the line, is across the primary winding of one half ohm. The arrangement of the three volts is this. One sixty-first of three volts is available at the primary terminals. The rest of the energy is wasted at the transmitter and battery. One sixtieth of three volts is one-twentieth. Supposing a nine to one ratio in the induction coil. The secondary pressure, on open circuit might be nine times one-



twentieth, or nine-twentieths of a volt. Surely this low pressure can not push voice currents very far.

With a fifteen ohm transmitter, the primary is acted on by one-sixteenth of three volts, or three-sixteenths of a volt. With a ratio of nine to one, the transformer secondary on open circuit should show nearly two volts. Surely, two volts will throw voice currents farther than nine-twentieths of a volt will. But on closed circuit, the ratio won't hold. It stands to reason that a local battery

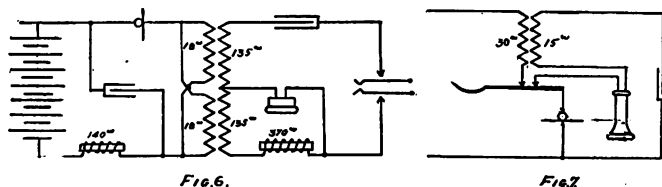


Fig. 6.

Fig. 7.

transmitter to give long distance results must not have a resistance higher than sixteen ohms. After all, it is a question of getting a primary circuit with energy enough to supply the demands of the line.

The difference between the subscriber coils, and the operator coils, is that the operator's coil, being in bridge, has to have a fairly high impedance, while the subscribers' coils, being in series with talking circuit, have to have a lower impedance.

Fig. 1 is the normal local battery subscribers' set. The primary resistance is one-third of an ohm, and the secondary about thirty ohms. This arrangement gives the best transmission in existence, if the transmitter has resistance low enough to allow of proper primary energy. While distortion is a factor in long distance service, it yet remains that there is another factor, and that is primary circuit energy. The more energy in the primary circuit that is available at the primary terminals, the longer the talk will be. On long distance work, this local battery set far exceeds any common battery set in existence.

Figure 2 is an ordinary operator's set, arranged for local battery. It has one-third of an ohm as primary resistance, and over a hundred in the secondary. It must have a high impedance, hence one will find more turns, and a higher ratio of turns than in the subscribers' coil. The most delicate tests fail to reveal the least gain of line pressure over the lower ratio coils.

Figure 3 is a type of local battery operator set, with the secondary and receiver windings split. This is done for purposes of busy test, and by reason of its balanced condition, suffers no inconvenience from its earth connection.

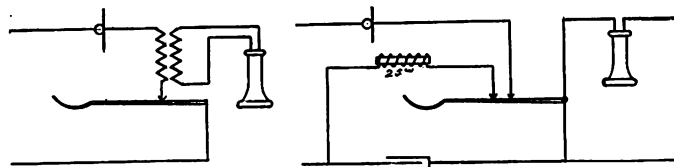


Fig. 8.

Fig. 9.

Figure 4 is the Bell type of common battery operator's set. The primary has twelve ohms resistance, while the secondary has 240 ohms. The following explanation seems appropriate. Twenty-two volts offers too much current for a transmitter. Consequently, 140 ohms resistance is required to keep the current within reasonable limits. But cross-talk exists between operators, hence to prevent it, a core of iron must be placed within the 140 ohm coil. But this iron core makes the voice utterly un-

intelligible. Hence, a condenser is placed to neutralize the retardation effects. In the secondary is a condenser, which prevents the operator from receiving a bad click when she throws her listening key.

Figure 5 is an independent type, with the condenser and transmitter of figure 4 reversed. This causes an alternating current in the primary. In early days, this was thought desirable, and many efforts were made toward that end. However, there is no appreciable difference between the arrangement of figures 4 and 5.

Figure 6 is a Bell arrangement of a common battery operators set, designed to prevent side tones. The primary is split into two windings, of eighteen ohms each. On the secondary side are two windings, each of 145 ohms. The receiver is placed in a bridge, composed of two arms of 135 ohms, and two arms of 350 ohms each. The line is supposed to furnish a resistance of 350 ohms, to balance the artificial 350 ohms wrapped non-inductively around the core of the coil. The receiver, being in a bridge, is supposed to be entirely out of the operator's talking circuit. She should not be able to hear herself talk. But she does.

To kill side tones on local battery sets, a three ohm coil, placed in shunt about the primary, will suffice. It cuts down the effectiveness of the coil, however.

Figure 7 is the Bell common battery subscriber's telephone set. The secondary set has 30 ohms, while the

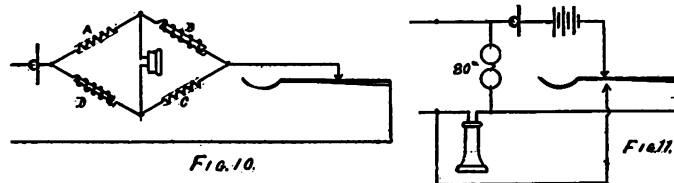


Fig. 10.

Fig. 11.

primary circuit, in series with receiver and the primary winding. With the condenser in the circuit, transmission is improved thirty per cent. over what it is without it. When used as an extension set, the temptation to leave out the condenser is strong, since there is no ringing to be done. That condenser is there for transmission, as well as ringing.

Figure 8 is the ordinary independent type of common battery subscribers set. The secondary circuit is closed with the receiver. The transmitter and primary winding are in the exchange battery circuit, so that lifting the receiver from the hook will signal central. The type has good sending powers, although receiving is not the best.

Figure 9 is another independent type, and departs from the induction coil. In series with the transmitter, is a twenty-five ohm retardation coil. Parallel with this coil, is a receiver and a condenser in series, so that all times, polarity of the receiver is eliminated. This type gives the best average results. The sending is a slight shade inferior to figure 7, but the receiving is considerably better. This type gives best all around service.

Figure 10 is another independent type, and an inspection of figure 6 will reveal similar conditions. The receiver is placed in a so-called bridge, which is really not a bridge, because with alternating currents, and a combination of inductive and non-inductive coils, it is impossible. There is a danger of wrong polarity. This set makes a good receiving circuit.

Figure 11 is a local battery type, and unusual. The eighty ohm ringer is permanently bridged, and is also a part of the talking circuit. It bears a strong similarity to figure 9. It gives good service.





strips of parafined paper, separated by tin-foil. On account of the condensing action of such an arrangement the name has been given it.

The action of the condenser may be illustrated by supposing a thin elastic partition to be stretched across the canal, in the analogy given in April SOUND WAVES. This partition will not allow the water to flow around the canal in either direction, but it will allow a surging effect to be produced. As the water starts to flow in one direction the partition stretches out and although there may be a little movement it soon ceases and then as the water

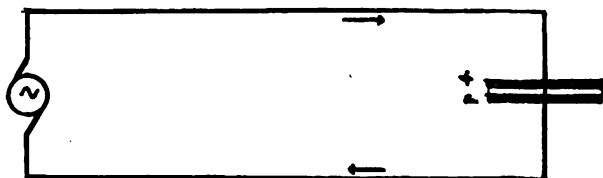


Fig. 18

starts back in the other direction there is a little movement in that direction which also soon stops. The partition will vibrate through a small amplitude and will not interfere greatly with the surging effect of the water as it alternately rocked to and fro.

It is found by experiment that the frequency of the alternations of the current affect its value in such a circuit. The higher the frequency the larger the current for any given pressure. The condenser acts like an impeding resistance placed in the circuit and in some respects like an impedance coil; the amount of impedance offered depending upon the frequency of the alternations and upon the magnitude of the condenser. It will be seen, however, that the effect of frequency is exactly opposite to that of an impedance coil in that here, the higher the frequency the less the impedance, while with an impedance coil the higher the frequency the greater the impedance. The consequence is that a condenser is used when it is desired to stop the flow of currents having a low frequency and allow the passage of those having a high frequency.

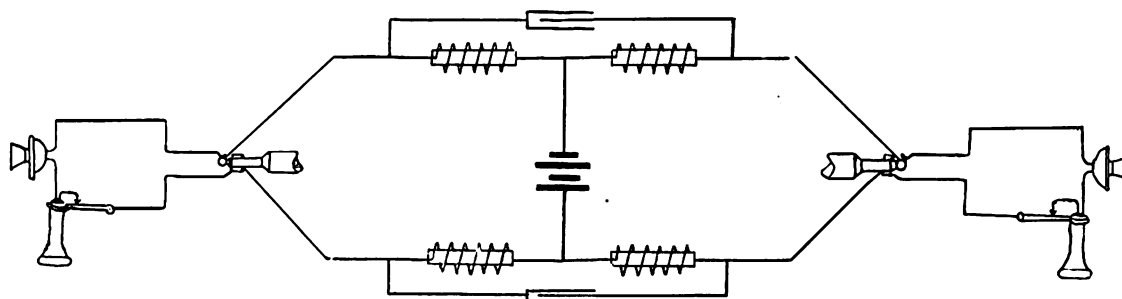


Fig. 19

In telephone work there are many instances where it is desired to stop a battery current but to allow a telephonic current to pass. Inserting a condenser in such a circuit will produce the desired effect.

Figure 19, shows the arrangement of a simple common battery circuit on which two subscribers instruments are connected together by a battery located at the exchange. The battery is bridged across the two sides of the cord circuit and furnishes the energy for the transmitters. Two impedance coils are placed on each side in series with the line wires, these being bridged across by a condenser. Now, if the battery were placed directly across the circuit without the impedance coils and condensers it would be impossible for the two subscribers to converse with each other as the telephonic currents would all pass through the battery, it being of low resistance. In order to pre-

vent this the impedance coils are placed in series with the line and a condenser is shunted around the coils. Now the telephonic currents coming over the line wires from either transmitter meet the induction coils but on account of their great impeding effect are prevented from passing through the battery and thus becoming lost. The condensers on the other hand, will allow these telephonic currents to pass readily and carries them on to the opposite instrument at the other end of the line. In this way they are confined to the line wires and do not lose any of their intensity on account of the battery.

There are many such instances in telephone work whereby a judicious use of condensers and impedance coils almost any effect may be produced. Some of the combinations as used by the different telephone manufacturers are very ingenious. This is especially true in complicated circuits where a great variety of signalling devices and apparatus for registering calls, collecting tolls and other kinds of service make the problems rather difficult.

### Substantial Evidence of Growth.

Substantial evidence of the growth of Independent telephone companies is noticable at Mt. Olive, Ill., where the Independent exchange has made arrangements with the Kinloch Long Distance Telephone Co., for connections, the same being made May 1st. Heretofore the Mt. Olive exchange was connected with the Bell, but with the first of May the Bell dropped out and the Kinloch took hold. When the connection was first made with the Bell, the Kinloch Long Distance Toll Line had not been built to Mt. Olive, but sometime after the line was put through and the company's superior services and methods so pleased the people there that they insisted on the local management, giving them the privilege of talking direct with the Kinloch long distance system, which, of course, meant disaster in that section for the Bell. In reference

to the above, The Macoupin County Enquirer of Carlinville, Ill., publishes the following: "The Kinloch is the representative of the Independent telephone interests of the country, which latter are of comparative recent origin. Up to about ten years ago the Bell had a complete monopoly of the telephone business, which they gained through a patent owned by them. When this patent expired the Independents sprung up and have increased so fast they have all but pushed the Bell off the map. Considering the circumstances this is one of the most remarkable happenings recorded in history. The Bell not only had a tight monopoly when their patent expired, but the business itself was in the nature of a monopoly—and yet they lost it. Few people know the extent of the Independent telephone business of the country. Take Macoupin county as an example; here there are 4,000 Independents."



# A Feature Lacking in Exchange Operation

By CHAS. H. COAR.

Time was when business companies or corporations having to do with the general public deemed it unnecessary to stimulate their business in any but natural or well tried channels, but it has been convincingly proven to the most conservative that there is much opportunity to improve upon the old cut and dried methods of arousing the public's attention to one's business, and also in showing the public how to obtain the best possible results out of what that business has to offer.

Many business firms have been quick to appreciate and grasp the advantages to be gained from employing good advertising matter and it appears inconsistent when one considers the rapid progress and evolution which has occurred in the electrical industry during recent years, to say that public serving electrical corporations such as telephone, telegraph or electric light and power companies are among the last to adopt the modern methods of acquiring new business.

There has occurred a gradual awakening among telephone companies during recent years that old business getting methods would hardly do in this age of advancement and in order to have telephone stocks rated as good on the market, modern methods have been adopted which would quickly increase the number of subscribers and consequently the volume of business transacted. The precedent of other business firms stimulating trade by means of advertisements being fully proven as efficient, it is but natural to think that telephone companies would utilize similar methods. For some few years telephones were mostly advertised by means of the signs attached to such buildings as contained telephones, in conjunction with a spattering of advertisement in the subscriber's directory. Often this was the full allotment. Later newspapers were utilized occasionally as were programs of various sorts, and so on increasing the amount step by step up to the present time when we find some companies which consider advertisements a very necessary adjunct to successful exchange operation.

The time is past when the general public will clamor at your door to see or buy goods; they first have to be interested, so it is necessary to constantly remind them of what you have and how they can obtain it. There are many different methods of accomplishing this result but undoubtedly the best and most universally adopted ones hinge on having something and then advertising it. That good advertisements pay is now generally conceded and while it at times necessitates what appears like a foolish outlay of money, by being persistent in the distribution of good printed matter pleasing results are sure to follow.

It is not the purpose of this article to describe the various methods of placing the telephone before the public or attracting its attentions, but the mail appears to form the best and most convenient method for telephone companies to adopt. Good descriptive matter sent to personal addresses invites inquiry and commands attention in many instances where other methods appear lacking. Solicitors are not considered in treating this subject, for it is most impossible for them to meet all the people which can be reached by mail. Solicitors have long been considered necessary.

In connection with mailable matter it is possibly needless to mention that it should be well printed and profusely illustrated to bring out the points it contains.

Statistics or numeral notations should be used little as possible, because the general public usually abhors a printed sheet containing these. Good, clear and original illustrations and catchy sayings is what the public likes to peruse and this fact is fairly well understood by advertisers.

There are so many opportunities to bring out catchy remarks, so many opportunities to depict scenes showing the importance and use of the telephone, that there is little excuse for advertisements containing bare facts. The telephone is so little understood by the people who use it that much readable matter can be printed concerning its history and adoption in such manner as to be highly instructive.

One finds so many subscribers who think a telephone system is composed merely of a telephone, a wire, and a saucy central girl.

Pamphlets or booklets containing views of the exchange and apparatus in addition to historical and descriptive matter will be well assimilated by the public. Semi-personal letters also have much influence in attracting personal attention. Newspapers, periodicals and poster advertisements should be made use of during a persistent campaign of advertising. As mentioned before one of the most paramount features to be remembered during advertising is that good illustrations tend to set forth the merits and advantages of your business in a more forcible manner than any one other feature. It is also well to remember that a spasmodic method of advertising will bring but little business, it being almost absolutely necessary to utilize "follow up" matter which can be enclosed along with statements, bills and other mailable matter. Memorandums, calendars, and souvenirs can be utilized to good advantage for advertising purposes and usually have a lasting effect, if the articles are well constructed. Don't advertise with cheap material, for it is a forerunner of your business and represents it to a certain degree. There are not many telephone companies which will send out poorly dressed solicitors to represent them, and the same course should be adhered to with their advertising matter.

Now to take up the matter of public demonstrations, a feature most sadly neglected by telephone companies, as an adjunct to advertising and also as a means of increasing the efficiency of telephone traffic. When a subscriber orders a telephone placed in his office or residence about all the instructions he receives on how to use it will be found in the telephone directory, and this information is usually confined to such operations as are absolutely necessary. In most instances he is also informed on how to drop his money in the slot and from what distance he should speak into the transmitter. This usually completes his education as far as the telephone company is directly concerned.

The results are seen daily by subscribers who are getting but little satisfaction out of their instruments simply because they do not understand how to use it to advantage. The traffic department usually confines its operations within the exchange building and constantly labors to increase the efficiency of the operating force, but to all appearances forgets or slights the subscriber's end of the line.

Operators have been quickened wonderfully, simply by schooling, which up to recent years was thought unnecessary, but the subscriber is comparatively as slow, as inefficient as ever in handling telephone calls. Long distance connections have done more than any other to increase the subscribers' efficiency in this respect for they soon learned that a needless expenditure of time meant a needless expenditure of money.

It appears that telephone companies could do much to increase the efficiency of their service by means of public demonstrations which would teach the public how to utilize the telephone to the best advantage, to say nothing of the advertising benefits such demonstrations would undoubtedly have.

Telephone companies have for some years seen the wisdom of opening the doors of the exchange to subscribers in order that the subscriber might have opportunity to learn what a costly and complicated system a telephone exchange is, and could they not at this time advance one step more by taking the exchange among the public to teach them its use? Public lectures with apparatus or stereopticon views which would tend to bring out the good and bad methods of using a telephone would be productive of much good. Today receivers are hung up theatrical fashion or upside down, in which position they can accumulate a lot of dust, thus decreasing their efficiency; telephones are placed in open windows or on steam radiators where they become subject to dampness, and the countless other similar conditions one can find telephones in probes conclusively that telephones are but little understood by the average subscriber. The many different methods of answering a call; of calling central; of giving numbers and other necessary operations are open to criticism, although these operations are usually outlined in the directory. It only goes to prove the well known fact that most people will not comprehend or fully grasp the ideas you wish to convey from simply reading them. It is safe to presume that these people could be taught the how and why if it were demonstrated in a manner such as is possible in connection with a lecture. Many manufacturing concerns whose wares are sold to the public have fully proven to their satisfaction that good demonstrations pay. Coffees, teas, baking powders, flour, stoves and articles of all descriptions are being publicly demonstrated daily. During recent years electric companies have launched forth along these lines and many of these concerns are beginning to see the usefulness of a demonstration parlor where the public can be taught how to utilize electricity for lighting, cooking, heating and all the other uses it may be put to with the aid of modern appliances. While there is but little opportunity for comparison between the business of a telephone and electric company, the same course could be adopted by telephone companies to work out a similar indirect result in addition to a direct result, namely that of aiding the traffic department in its important task. The in-direct result would be due to the publicity that the telephone would receive during the lectures and demonstrations. I firmly believe that most telephone companies would be well repaid for the time and money spent in providing for a series of lectures on the use and abuse of the telephone in the territory covered by their respective system. The lectures should be illustrated if possible and should cover thoroughly all such points as would be beneficial to the subscribers.

Emergency methods of telephony should be explained, for undoubtedly many important telephone conversations could have been saved if subscribers but knew that they

could utilize the receivers for talking when the transmitters fail to respond. Receivers disconnected, wires broken at the telephone binding posts, etc., could often be temporarily repaired by the subscribers if they knew what to do in emergency cases of this kind. The lectures should be devoid of technical phrases or other terms not easily understood, and if a church building could be obtained to hold the lectures in, no difficulty would be encountered in getting an audience because churches are usually well located with reference to the population and any event booked to occur in a church is most apt to command attention.

Should lectures of this description appear needless or too pretentious, then have some competent man appointed to visit new subscribers and explain the operations so that the subscriber can utilize the telephone without becoming an elephant on the operators' hands. Should it be too costly to appoint a man for this purpose, then instruct the instrument setters or inspectors so that they can inform the subscribers and allow them sufficient time in which to do so.

While such information printed in a directory don't appear to be well assimilated by the subscribers, possibly if it were placed before them by means of some specially illustrated pamphlet different results would follow.

Merchants who make extensive use of the telephone in business know the advantage of this sort of advertising and many send out instructive information on how to utilize the telephone to the best advantage in connection with their business.

In most instances telephones are paid for by the month under yearly contracts irregardless of the usage and for this reason their operation should be so arranged as to be as inexpensive to the company as possible. The exchange end is being well taken care of with this point in view but the method of subscribers is much the same as it has always been. If telephone companies could impress into their service a method which would be generally adopted by the subscribers during calls, it would do much to facilitate and decrease the expense of the company so fortunate. At present most any individual will respond with a "Yes," when asked if he knows how to use a telephone, but can this be the strict truth always? Facts compel one to reply in the negative.

We have great need for better subscriber education.

### USE A CLUB, BROTHERS

The Baltimore Sun points out that the New York Telephone Company, having reduced its rates to five cents a call over the city of New York, an area larger than that of Baltimore city and county combined, the Chesapeake & Potomac Telephone Company could very well reduce its rate to five cents over a less area in view of the contention that the larger the exchange the greater is the cost per message.

This ingenuous appeal must have provoked Homeric laughter up on Milk street, Boston, if they ever saw it up there. Nobody ever heard of the Bell company giving away anything unless it was pushed or pulled into doing so. The only way by which the Baltimoreans can get relief is to do as New Yorkers did and as Chicagoans are doing—use a good, stout Independent club—threaten their revenue—and then watch the plum tree quiver.

# The Manager, the Superintendent and the Wire Chief.

By L. D. COX, E. E.

When a telephone exchange has passed the 500 subscriber mark in its speedy growth toward Independent victory, it must then take on a new form of organization in the operating department and be placed on a perfect system of division of labor. A telephone exchange is rarely successful when operating beyond the 500 subscriber mark with the manager acting as lineman, wire chief, collector and workman in general.

It might appear, then, that the manager's duties have become light and "snappy," and unworthy of reasonable salary. Not so in the least. His burden of great responsibility has just begun, and in proportion to this responsibility should his salary be increased, for it is quite evident that the success of all other divisions of labor under him rests entirely upon his shoulders.

In an exchange of 500 subscribers there should be in the operating department, the manager, the superintendent and probably one inspector or troubleman. If the system be poorly constructed and mostly of open work, there should probably be two of the latter. The manager should also have charge of the clerical department in which there should be one collector or bookkeeper employed. No further division is necessary until the exchange reaches the 2,000 mark, at which time another division should be promptly made. In the meantime the salaries of the heads of the division named should be slightly raised and additional under labor employed as needed. Fig. 1 shows the division of labor for an exchange of 1,000 subscribers and the respective salaries that should be paid, the latter of course, varying somewhat with circumstances.

Manager \$100.00	Chief Operator \$30.00	{ Local Operators
	Superintendent \$70.00	{ Construction Gang Inspectors \$40.00
	Collector \$30.00	

(Fig. 1)

When an exchange has passed the 2,000 subscriber mark there soon must be a change in switchboard—if it be manual service—the multiple board succeeding the transfer system, and, if previously a magneto system, the rebuilding should include the transformation into a common battery system.

When the battle of rebuilding is over we should find at their respective stations the following heads of the various branches of the operating department: The manager, the superintendent, the wire chief and the chief operator. The manager should yet have charge of the clerical department unless the secretary as an executive officer desires to enter the services as an active member of the clerical staff. The manager, however, may also be secretary, and when convenient this should be the case. But under all circumstances telephone companies should respect titles. Employees appreciate it, and the subscribers find convenience in it when they have business with any of the various branches. A company operating an ex-

change of large capacity, who places at the head of the operating department a secretary, and labels all the other heads of the branches as assistant secretary, second assistant secretary, etc., is "slouchy," and needs reorganization. We cannot all be secretary, so let us be called what we are and what our duties might indicate.

Fig 2 shows the division of labor in an exchange of 5,000 subscribers, and the respective salaries that probably should be paid.

Manager \$150.00	Chief Operator \$30.00	{ Local Operators	{ Inspectors \$50.00 Switchboard Electrician \$75.00
	Business Office	{ Wire Chief \$100.00	
	Superintendent \$125.00	{ Construction Gang	

(Fig. 2)

Five thousand subscribers nowadays marks the maximum growth of a single exchange. The time is right at hand when to load a single switchboard beyond this capacity will be considered extravagant and inharmonious. Branch exchanges must be established and trunk lines installed to properly handle a larger system. In this case it should be arranged for one manager to have charge over all. Each branch exchange, however, should have a superintendent directly in charge, over a certain district corresponding with the subscriber connected to his exchange.

But we will consider briefly the respective duties of the respective heads named for a single exchange of 5,000 subscribers. The manager in such an exchange should also be an executive officer of the company, a director, and the highest practical authority of the organization. His office should be commodious, and should be subdivided into at least two compartments—Business and Reception.

The time has long since passed when telephone companies can successfully "bulldoze" their service into the ears of their patrons. People who are paying for telephone service must and should have a hearing when in the least justifiable. Their complaints and suggestions, when made in person, will necessarily be headed at the manager, who should be one that can meet each and every visitor with a smile of gratitude and assist him in being recognized by the head of the department to which his business may appeal. Therefore the reception room and the social part of a manager's duties.

The manager's business desk is the final stopping place of all practical and theoretical business that has not previously been handled and adjusted by some of the heads under him. Business of this nature may come directly to him from either the superintendent or chief operator, but never otherwise unless by observation. At the manager's desk all practical and theoretical matters reaching it must be solved. They have no higher appeal.

They cannot be taken to the president nor to the directors. The manager is responsible and his decision must stand, whether it be the right solution or the wrong. It is useless to go farther with his duties. We have thus far named sufficient work for him, and know beyond a doubt his great responsibility.

The superintendent is purely an operative employe. He has charge of, and is held responsible by the manager for the condition of the general working parts of the exchange and the successful installation of new appliances and apparatus. He is authority over two branches, the heads of which are known as the wire chief and the foreman of construction. He has charge in detail of the draughting department, and oversees as best he can all construction and maintenance of the exchange. He should have a commodious office of two compartments. Business pertaining to routes of construction, kind of construction, rebuilding, wage troubles and the like, rarely should pass his desk for decision.

The wire chief is a busy man. It is unfortunate that the wire chief's duties are so monotonous and confining. Were it otherwise, surely there would be no strain of monotony existing in any branch of the telephone business, but all would be fascination and charm. The wire chief is responsible to the superintendent for the prompt solution and locating of circuit trouble, whether it be switchboard, line or telephone disturbance. He must file trouble reports with the switchboard electrician for interior trouble, and see that same is promptly repaired. He must file trouble reports with the linemen and inspectors for trouble in the outside circuits and in the telephones. He must be a man of good mathematical ability, and one who has had experience in wheatstone bridge measurements and thoroughly understands resistance calculation. He must be a theoretical and practical man, alert and willing to keep things moving. His station is always apparently more busy than any other, and very frequently needs an assistant to assist the wire chief in promptly handing out his numerous files of trouble.

## Competing Systems in the Independent Field

E. C. DICKINSON, GENEVA, ILL.

Some advocates of manual telephony assert that automatic operation is impossible, while the advocates of automatic systems assert with equal emphasis that an automatic system can do the work of a telephone exchange to a better advantage than it can possibly be done in a manual way.

The arguments on both sides are so convincing that the prospective purchaser is left in a dilemma which is very perplexing. He must investigate both sides of the question as best he can, and decide for himself, or he must take the advice of an expert.

Every telephone user is familiar with the operation and quality of service given by manual systems during the past few years, either as a subscriber to some independent exchange or to a Bell exchange, and most of us know something of the old magneto system as well as the up-to-date common battery system, to say nothing of the quality of service rendered by 10 party lines, 4 party lines, and farmers' lines. But with automatic service we find very few telephone users and very few telephone engineers who are at all familiar with the method of operation and the quality of service given by automatic systems. If one can believe the testimony of subscribers to some of the recent automatic exchanges there remains no doubt as to the quality of service in present automatic systems of less than 10,000 capacity. Several standard arguments against automatic operation seem to have failed completely, and we find a great majority of subscribers perfectly satisfied with automatic service.

As to the relative advantages of the two systems there is certainly nothing simpler (and Simplicity is Perfection) than to take down the receiver and repeat the number wanted into the transmitter.

This looks like the last stage in the development of a telephone when operated through a manual board, but it is not in the telephone that the trouble exists. If the operator answers at once all goes well, but if one is kept waiting a few minutes, or if one gets the wrong number

two or three times in succession, one is convinced that there is room for improvement. Both these annoyances and many kindred to them will occur in any manual exchange as long as girls are girls.

Against this defect in all manual systems the automatic has one which is inherent with all automatic systems, simply because the automatic exchange is composed largely of mechanism which must be treated as such. As long as the automatic apparatus is working perfectly there is no cause for complaint, but if the exchange mechanism or the calling device in the telephone gets out of order then the subscriber is helpless. He has no direct means of notifying the central office, and no positive way of making any other connection. In such a case or until the trouble is removed his telephone is practically useless. These and similar troubles in the two systems may be weighed against each other with a little advantage in reliability on the part of the manual system and a slight advantage in speed in favor of the automatic.

Line troubles produce similar effects in either system.

The prospective purchaser then can safely eliminate this question of service with some advantages on both sides. The most important question to be considered in the selection of an exchange is the earning power of each invested dollar per subscriber, call it what you may. If an automatic exchange will earn a greater dividend on each dollar invested than a manual system, then the automatic is the one to adopt, no matter if the first cost is higher.

The advertisements in current telephone literature lead one to believe that there are scores of perfect systems. Many of the stock phrases are nearly worn out but are still used by numbers of advertisers. Expert selection of material and expert workmanship in all departments are sure to be points of advantage in telephone factories.

Every telephone user is familiar with the defects of manual systems and therefore can temper these claims with some reason, but everyone does not know the de-



fects of automatic systems, and the same can be said of their good points.

The automatic people have always claimed more than they could do. Ten years ago they claimed an unlimited capacity, today they claim an unlimited capacity, still everybody knows that their capacity 10 years ago was not more than 200, and today it is still limited, although capable of making 100,000 connections.

The circuits and mechanism ten years ago were experimental, not even so much as sound telephone principles were used, claims were made for the system which could not be substantiated and business methods were followed which were sure to bring the reverse of success.

Although the mechanism put out in the early 90's worked with surprising exactness in small exchanges yet it cannot be gainsaid that the system generally made much trouble for the exchange attendant as well as the subscriber.

The first Strowger switch with its vertical and rotary motion was capable of making 100 different connections. By the addition of considerable complication these switches were made to serve several hundred subscribers, but the switches were not capable of serving a large exchange. If more than 400 subscribers were to be served the multiplicity of contacts became so great as to make the system impracticable. The system was further defective in that the operating magnets were included in one side of the line, tending to produce an unbalanced circuit. There was also a common return or battery wire in the exchange, through which all conversations had to pass. With such a design the chances for cross talk were very great and the trouble grew with increase in the size of the exchange. The most important consideration, however, was to increase the capacity of the system so as to care for business which was thought sure to come. To do this with a single switch was impossible, the size of the switch, if nothing more, was sufficient to condemn the method entirely. It was not until some form of transfer system was adopted that a ray of hope dawned upon the horizon. By this means, which is used in the present system a call is transferred from one switch to another leaving the individual mechanism comparatively simple.

We may rightly call it a transfer system because of its close resemblance to the transfer system in telephony. Most telephone engineers are now familiar with the Strowger switch, which in its simplest form is capable of making 100 connections, to as many separate circuits. If instead of allowing this switch to connect directly to subscribers' line circuits, we cause it to connect to a number of circuits each of which leads to the terminals of another switch similar to the first, and allow these second switches to connect to line terminals. We can in this way multiply the capacity of the exchange by 100. This method is a result of one of the first attempts to increase the capacity of the original Strowger system after it had been tried in exchanges of 100, 200 and 400 subscribers. The scheme proposed was to provide two switches for each subscriber, the first series called selectors were arranged in groups of 100, and the second series, called connectors, were also arranged in groups of 100. A possible 10,000 circuits were available to any subscriber in such a group, but not at all times, for interference with conversations in progress could not be permitted, and accordingly it was arranged to have the subscribers wait when two or more desired conversation with numbers in the same hundred. One subscriber in a group of 100 could therefore prevent the remaining 99 from calling in a particular hundred,

the ones cut out were given the busy signal when an attempt to call was made and were thus led to believe that the line wanted was engaged, unless as it sometimes happened, they got information to the contrary from an outside source.

The mechanism of this system was by no means mechanically or electrically perfect, still it was astonishing to note the accuracy with which it would select so great a variety of numbers.

The grouping arrangement, however, was manifestly impossible; it is a little difficult to understand how capital was ever induced to support such a scheme, especially when the discouraging results are considered.

The greatest objection to the system thus far developed was the fact that a subscriber could not secure connection at all times even though the exchange mechanism was comparatively idle. The fact that one subscriber in a group of 100 could tie up the remaining 99 made it necessary for further development. The talking circuit with its magnets in circuit and a common wire in the exchange were also not up to the standard. Improvement was thus necessary along two lines: First, to give all subscribers access to all the lines for a percentage of the time or to give a certain percentage of all subscribers access to all the lines at all times, and second, to give all subscribers a perfectly balanced talking circuit and thus to make cross-talk a negligible quantity, or at least to provide as good a talking circuit as was to be found in manual systems of the same period.

The fact that only a small percentage of the subscribers to an exchange ever wish to call at the same instant, made the solution of the first problem possible without requiring a preponderance of mechanism. As regards possible connections, the problem was in no way different from a similar problem in manual practice. A certain number of connecting cords are always necessary in any manual system for every section or group of line jacks, so in automatic practice a certain number of connector switches are necessary in order to enable all subscribers to have free use of their telephones.

These connectors must be equal in number to the maximum number of conversations passing through the exchange during the busiest portion of the day. This maximum is generally taken at 20 per cent. Such an allotment of connector switches is sufficient if subscribers of all classes, business, residence, etc., are carefully intermixed in each group so as not to have too many excessively busy subscribers in any particular group. Although there might be provided a number of connectors equal to the maximum number of conversations at the busiest portion of the day, these connectors do not all have access to all lines; each has access to only 100 lines. It will therefore be easily understood what trouble would occur if the groups were not carefully proportioned.

Returning to the subject of providing each subscriber with means of connecting himself with other subscribers a given number of times each day, we find from telephone statistics that the occasion never arises when all subscribers wish to call at the same time, so after providing an individual switch for each line entering the exchange only a limited number of similar devices are required in the second group, and since the Strowger switch is only capable of attaching itself to 100 different circuits it follows that for large exchanges of 1,000 or more, a group of connecting switches must be provided for each 100 connections required, or for each 100 line circuits, and since any one or any number of these

switches up to the maximum may be engaged at any time, it follows that some sort of device must be provided on the first or individual switch for automatically selecting the first disengaged of a number of connectors, as they are called in automatic practice. This automatic selection of trunk wires, each of which represents a second set of switches, is one of the most important steps in the development of automatic systems. It is difficult to conceive of any other means of performing the functions of a telephone exchange automatically and commercially. We believe that automatic exchanges are here to stay, and further that in all automatic systems of the future some sort of an automatic selector must be provided.

A mechanism which will select a given number or a part of a number, guard the connection against any possible interference, and release or break each connection after a given signal had been sent from the telephone, must necessarily be somewhat complicated, further it must be expensive to manufacture because it must be well made. The first cost is sufficient reason for eliminating such mechanism wherever it is possible to do so.

The automatic selection of trunk lines aside from giving each subscriber access to all lines, also makes it possible to eliminate a great percentage of connectors which otherwise would be required.

The first double switch system of the Strowger people had a capacity of 1,000. It required one selector and one connector for each subscriber with the interference possibilities mentioned before. With the automatic selection of trunk lines the system as used at present requires 1,000 selectors and only 100 connectors, with the advantage that 20 per cent. of the total number of subscribers can talk at any given moment. This percentage can be increased to 40 by dividing the selectors into two groups and doubling the number of connectors, making 1,200 switches in all. Aside from the features outlined in the foregoing, several other important improvements have been added, so that automatic selection of trunk lines, a perfectly balanced talking circuit, a perfectly guarded circuit, central location of power, battery and power generators, are now permanent features of the automatic system.

All automatic exchanges to date have depended upon local battery for talking purposes, but the advantages of a central battery are as obvious in an automatic as in a

manual system. The automatic people have now in course of construction a large exchange which will be entirely common battery, so this may also be added to the permanent features of automatic working.

There has been much speculation as to the ultimate outcome of the question, Manual vs. Automatic. A few years ago no one outside of a few automatic enthusiasts would consider such a proposition for a moment, the automatic idea was ridiculed. Now many staunch believers in all manual practice are half converted and talk of manual automatic systems. Their conversion came, however, not in a logical way but as a direct consequence of a severe shock which accompanied the establishment and successful operation of several large automatic exchanges. There was no process of reasoning in the change of opinion, it was all too sudden. Now, the question to telephone manufacturers and telephone users alike is this: If manufacturers of manual apparatus are feeling the competition of automatic systems, or if they have any other reason for serious apprehension, then what will happen when a few years have passed, giving the automatic manufacturers time to refine and reduce their apparatus along well defined lines?

It has taken a dozen years to bring the automatic system up to its present state of development, and the apparatus is still crude in many respects, but development has not ceased and five years will bring forth improvements now little dreamed of in the telephone art.

There are certain definite lines which must be followed in the design of an automatic telephone exchange, but the possibilities in mechanism and circuits are almost infinite. There is a very broad field here for inventors. The very nature of the work admits of a great variety of ways of accomplishing certain ends.

While there have been granted something like 150 patents on automatic exchange systems and apparatus, it can safely be said that ninety per cent. of them are worthless. Considering the advanced state of the telephone art generally, it seems therefore that if there is to be development in the future, that it must lie in the direction of automatic operation. Toll work will probably always be handled manually, but with a little refinement in mechanism and with other improvements which must come in the next few years, there is no reason why all local calls should not be handled automatically.

## How to Handle Three-Company Business

BY T. F. ROBINSON, Pipestone, Minn.

With the experience I have had it seems to me the question, "How to Settle Joint Business," is the most difficult proposition of anything pertaining to the business.

Telephone "Joint Business" is not exactly paralleled by any other business. The Postal service is the closest, as joint business is done with the foreign countries.

Railroad companies do a joint business with each other and have adopted methods so they are at present working under a system which is more simple than we can adopt; for when a company has carried an assignment of freight to the point where it is to be transferred to another road, charges are collected, the receiving company puts on its advance charges and so on until it

reaches its destination. There they collect total charges.

When a telephone company has a message that travels to a foreign line there is no way of stopping the talk and collecting their advance toll. The message must be settled for either at the station where it originates or terminates, yet it may travel over several companies and it rests with the companies to adopt a system by which settlement can be made that will be fair and satisfactory to all.

The committee in assigning this subject to me undoubtedly wished my own ideas, which I will try to explain.

First, all connecting companies should adopt one tariff rate, one block route, one terminal fee and the paying of

the same commission, then I believe it is possible for them to arrive at a satisfactory settlement. The question arises, "What would be a satisfactory commission and terminal fee"? Most of the toll line companies are paying a commission of 20 per cent. on all out-business up to 50 cents and 10 cents terminal fee on all in-business, and it seems to me that either one is not exorbitant, especially to the local exchange owner who at the present time owns farm lines extending out of his exchange from ten to twenty miles. On out-business he is put to the expense of collecting most of the toll from farmers and local subscribers and is sure to suffer a certain percentage of loss, being compelled to do a credit business, therefore is entitled to a fair commission. On the in-business, many times he carries the message out in the country more miles than the toll line company has carried it, therefore by including both country and town phones it averages up so that a 10 cent connecting fee compares very favorably to toll rates charged, or with the United States mail in special delivery, as they make a charge of 10 cents to deliver a letter if it only goes next door to the postoffice.

Understand me, I do not say that it is necessary for toll line companies to pay the above commission, etc., to their agents, yet they should agree upon some kind of terms similar for joint settlement, especially commission paid, which I consider the most essential. For example, we will say a message originates at a local exchange,

owned by local parties, and is carried by the toll line connected with said exchange a distance of eight miles: there it goes on to a foreign line to reach its destination, and if it travels 80 miles, the tariff is 40 cents, the toll line company pays a commission of 20 per cent., which is 8 cents, but in settling joint business they do not deduct commission but settle on line haul, they would only receive 4 cents. Therefore, by having the message they would be out the use of their line and 4 cents. If commission were deducted first the toll line company would receive 3 1-5 cents for the 8 miles of line haul.

With the above commission adopted, a fixed route and same tariff rate, companies could then arrive at a joint settlement by first deducting the commission paid where message originates, then deduct the terminal fee, then divide the remainder according to the number of miles of line the message is carried by each company, as per block route.

Some believe that a clearing house is the proper way for settlement. Where would you locate it? Supposing we locate it at Sioux Falls. As soon as you get the hundred miles east of here they have as many messages east as west, and so until we reach the Atlantic. The one great trouble is there is no jumping off place. The same applies to the telephone business in general.

[The foregoing paper was read at a meeting of the South Dakota Independent Telephone Association held at Sioux Falls in January.]

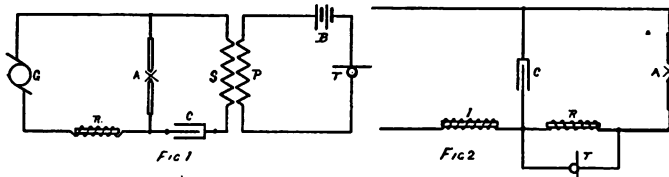
## Some Things a Telephone Can Do

W. A. TAYLOR.

We are so familiar with the ordinary uses to which a telephone may be put that we are apt to think that there may be no other utilization. Some of our readers may have heard of the speaking arc lamp.

By means of the transmitter connected properly, an ordinary electric arc lamp may be made to speak loudly enough so that all in a large room may easily hear what is said. This arrangement is somewhat mysterious to those who do not understand the theory of the action, but quite simple when explained.

As we all know the electric arc light depends for its light upon the heat engendered by the passage of current from the end of one carbon rod to another. Where the



current leaves the end of the rod and where it strikes the end of the other the carbon is heated to a very high temperature. Between the ends of the rods is the arc, consisting of the vapor of carbon. The temperature of the arc is exceedingly high, and as the temperature depends upon the amount of current flowing, it will be understood that any change in the quantity will change the temperature. A change in the temperature will cause a variation in the volume of the arc, making it smaller as the current diminishes and larger as the current increases.

It has been found that a very minute change in the

flow of the current makes a perceptible change in the arc. If the change in the volume of the arc is rapid enough, any sound may be produced, so if a transmitter of a telephone is placed in the circuit properly the arc may be made to talk loudly.

Figure 1 shows the arrangement of the circuit for one way of connecting the arc for speaking. A represents the arc of the lamp and G is the generator from which comes the lighting current. T is the transmitter, B the battery for the transmitter, and P the primary of an induction coil. When the transmitter is talked into, a current is generated in the secondary S. This secondary current passes through the condenser C and the arc A causing the proper variations in the arc. The condenser C is placed in the circuit to prevent the lighting current from passing through the secondary of the induction coil. The best results are obtained by having an impedance coil R inserted in the lighting circuit to prevent the talking current from backing up through the lighting mains. This coil may be the series magnet of the lamp, if there is one. The condenser should be of large capacity, so that a large volume of the talking current may pass.

Figure 2 shows another way of arranging the circuit. By this method the current from the mains provides the energy for both the lamp and the transmitter. Here A is the arc, R an impedance coil, T the transmitter, C a condenser of large capacity and I another impedance coil.

The transmitter is shunted around the coil R so that the current is divided between the coil and the transmitter. The resistance of the coil is so that the transmitter will not take sufficient current to injure it. The

talking current passes through a local circuit including the condenser and the arc. The coil I is placed in the circuit to prevent the talking current from backing up through the lighting main.

To secure the greatest success the transmitter should be able to carry a large amount of current. At least one ampere should be carried without injury to the instrument. The induction coil in figure 1 should be wound for both quantity and voltage.

It is remarkable how loud the arrangement will talk. The loudest transmission is obtained when a lamp having a long arc is used for then the variation in the volume of the heated gases is greatest. The carbons should be of the best grade. The cored variety is much the best. The current should be direct, either from a direct current dynamo or a storage battery.

If the size of the arc is changed, it stands to reason that the light will be changed in direct proportion. This fact has been utilized by at least one inventor in telephoning without wires. A small cell composed of selenium has the property of being affected by rays of light so that

its resistance varies according to the intensity of the light which falls upon it. If therefore the rays from a speaking arc fall upon the selenium cell, its resistance will be changed in the exact proportion to the change of the intensity of the light rays. The cell is connected in series with a battery and a receiver and the sounds may be heard plainly in the receiver.

It has also been suggested that a sensitive photograph film be passed rapidly before the talking arc and then developed. Afterward this film may be passed before a steady light so that the light rays pass through the film upon a selenium cell in circuit with a battery and a receiver. The chances are that the record of the original conversation in the transmitter will be reproduced.

It is easy to see how this speaking arc may be made to serve the purpose of an advertiser. An arc light may be hung out over the walk in front of some store, the owner of which wishes to make his wares known. Passers by will certainly take notice. A telephone exchange may also create public interest by having one or more such lights where they will do the most good. The very elements will cry out in favor of the exchange service.

## Better Long Distance Connections

C. H. SMITH

At the present day the long distance telephone service is as much in its infancy as was the local service ten years ago. While exchanges have brought their local service to what is perhaps the highest state of development, not only in the way of apparatus, but also the number of subscribers, their toll business has lain dormant. The average independent company, upon starting an exchange, drew about one-third of its subscribers from persons who heretofore had never subscribed for a phone. So it is with the long distance business. We must not be satisfied with a share of the Bell Company's business, but we must create more toll calls. And business can only be created by aggressively pushing it.

Advertising and publicity of any kind is effective, but the bulk of the business must come from personal solicitation. Your advertising, if effective, will bring your business which heretofore has been enjoyed by the Bell, but very rarely will it make any new business. Most business men have the characteristic which is commonly attributed to the residents of Missouri alone, that is, they require "to be shown." They need to be shown where the long distance telephone will both increase and facilitate the transacting of business. Practical demonstrations are usually successful in getting business. If a man is skeptical regarding the value of the long distance phone, have him call some party with whom he transacts business and let them talk without charge, and then when they are through, ask him whether he don't think that method of doing business far superior to any way he had ever tried before. But before starting out to increase your toll business, it is a good policy to look closely into your toll lines and equipment and if they are not up to the standard, bring them up, and then when you are in good shape to give satisfactory service, don't be afraid to go out and tell people about it.

An idea, which is so universal that we have even found exchange managers who believed it, is that the Independents have no long distance service worthy of

mention. As this idea has been allowed to rest undisturbed in the minds of the public for ten years, it is going to take some hard work to make the public in general see that it is false. Actual practice has demonstrated beyond doubt, that it is better that all toll lines in the state should belong to two or three strong companies, who would possess the necessary means to build them according to standard construction and maintain them in a like condition. It is the policy of our company, the New State Telephone Company, to build all of our main toll lines of No. 10 copper, but as the majority of lines we connect with are iron, it would not improve the service any for us to invest the additional money required by the copper. It is a reflection on the Independent interests in general, the condition of some of the alleged toll lines.

We have lines running out of Sioux City, all copper for the first fifty miles, then there will be a stretch of grounded line, then a barb wire fence line and then we strike copper again, and some of the small exchanges wonder why the line don't talk well and try to make us believe that the trouble lies in our forty miles of standard copper. We would willingly in such cases, enter an agreement with these exchanges to take over their existing lines and replace them with ones of standard construction, but the average exchange manager refuses to either sell or improve his lines. I would like to see this association adopt a uniform style of construction, and every line which inside of a special time, say a year, did not conform to this standard, should not be allowed to connect with standard lines.

We have several hundred miles of copper toll lines which we do not believe can be bettered, and the service over these lines is giving perfect satisfaction. And it isn't fair to us to route calls over imperfect lines, as we would be blamed for the resulting poor service. We have been holding conventions and reading papers on long distance service for some years, but now is the time when we ought to take some practical step to improve our long



distance service. Our intentions have been good, we all know, but we never heard of good intentions ever improving toll service, no matter how often they have been "transposed."

At present, even the manufacturers of Independent telephone supplies, who depend on us for their business, advertise their Bell number, as Long Distance Telephone Number 97, etc. This condition of affairs is certainly not very creditable to us. While they are operating many local exchanges at a loss the Bell Telephone Company's stock continues to sell above par, and I can't remember ever reading about a Bell stockholder starving to death. Why is this, you may ask yourself? It is this: because the Bell is getting the cream of the telephone business—the long distance business. The general manager of the Nebraska Bell has said that he "would quit operating if he could get the toll business." That remark shows plainly what our formidable opponent thinks about the long distance service.

While it takes a large amount of capital to properly engage in the long distance business, if properly handled you will receive a fair return on your investment. However, the toll business in its present state of development does not near pay the dividend that the average local manager thinks it does.

The last two issues of Success contain a series of articles on "Fighting the Telephone Trust," by Paul Latzke, which handles the Bell telephone system and their method in a strong, forceful manner. These articles ought to be reproduced in every paper in the land. And I would like to see this convention make some arrangements for a press bureau, which would see that any news favorable to our cause is made public.

Jesse W. Weik in an article entitled "The Telephone Movement," published in the Atlantic Monthly and reproduced in the March issue of Telephony, predicts that the days of Bell supremacy in the long distance field are numbered.

The Atlantic Monthly is a publication of sterling worth, and as it is published in what has always been regarded as the impregnable stronghold of the Bell Telephone Company, Boston, and a stronghold which the Independents even flushed with victory as they are, do not even have the temerity to try and enter.

A great many of us make the mistake, and a serious mistake too, of underestimating our rival's strength. Disparage it as we may, the Bell Telephone Company has a superb organization, and while it always draws applause for some speaker at Independent conventions to loudly and exultantly acclaim, that the dissolution of the telephone trust is nigh, it is a statement which is far from being true.

An apt illustration of the present status of the telephone situation would be a picture of an octopus with tentacles reaching into every town and hamlet in the land, all conveying nourishment to the parent body. The telephone forces might be likened to a man with an ax, industriously chopping off these tentacles or feeders, and while he has been laboring with a fixed purpose for ten years, he has not yet succeeded in seriously crippling the octopus, though we know he has inconvenienced him somewhat. I presume a trifling matter like passing a dividend or a stock assessment may be referred to, as an inconvenience.

One of the great problems facing the Independents today, is the sub-licenses. Our weaker brothers should be shown that it is to their interests to remain in the Independent fold. If any company needs assistance in any

manner whatever, they should submit their case to the clearing house manager, who would, without doubt, help them in a more substantial and lasting manner than what the opposition does. It does not help matters to call the sub-licensees ugly names, but we must be prepared to go to their rescue, and go quick.

We have in Mr. Hewes, the clearing house manager, a veteran, practical telephone man, upon whose judgment any Independent company might well rely, and who is well fitted to handle any problems that may come up to vex and harass our smaller brothers. If before tying up with the Bell, these companies would only let the clearing house know, doubtless an arrangement would be made that would be mutually profitable to both him and the rest of the Independents in the state.

The Bell Company, or the "cracked Bell" as it is called in Ohio, has evolved another line of attack. An Independent system does not have to lease Bell transmitters or receivers, does not have to sub-license, does not even have to sign a contract to get connection with the Bell, for it now says, "Just let us attach our toll lines to your board and you give us such business as you cannot send over other lines." Its disastrous failure to crush the Independent uprising by a cut rate, free service, litigation, buy-up-and-wreck, sub-license policy has led it to adopt this humiliating line of attack in its final effort to overthrow the Independent movement, which it must do, if it ever again gets an opportunity to extort from the people the millions it has sunk in its futile attempt to keep the public in telephonic bondage.

But gentlemen, every dollar that goes into the Bell coffers is just that much more sustenance for the octopus, just that much more strength to be used in overthrowing us all. Beware of the Bell—if you can see no evil in their intentions it is because you do not look deep enough. In the twenty years of its existence, the Bell Company has never been noted for philanthropy, and it isn't likely that they are ever going to do anything to help anyone that doesn't help them a thousand fold. If you are in doubt what to do, a good plan to follow is just to do the reverse of what the Bell really wants you to do. Most of the Independent companies were organized for, among other things, to pay a fair return on their investments, and when local competition is strong and they have no long distance connections a Bell sub-license agent drops in and makes him their usual proposition, why, of course, the Independent company looks on him as an angel in disguise and loses no time in accepting it.

Now the Independents can and must make these companies an offer which will conclusively prove to them the advantage of remaining in the fold.

Another point which is vitally essential to good service is that the local exchanges must keep their instruments in good condition. There are towns which we reach, where it is absolutely impossible to get a call through without it being repeated, owing to the local company's poor transmitters and equipment. This is a great detriment to any toll line company getting business.

In a frantic effort to get rates as low as possible and still keep alive, a number of the smaller Independent exchanges use equipments that would discredit any reputable junk pile, let alone a telephone exchange. These companies usually rely on public sentiment and cheap rates to keep going. While the good will of a community is one of the Independent company's most valuable assets, still it is not a satisfactory substitute for good service. The public today demands good service and is perfectly

willing to pay for it. Very rarely do we hear the cry any more, for cheaper telephones, and when we do hear that cry, it is from some farmer who has been figuring the cost of a telephone line out of Montgomery-Ward's catalogue.

In Sioux City, for instance, the automatic residence rate is higher than the Bell, and still they are gaining subscribers every day. But they are offering the public a class of service that is far superior to what the opposition gives or ever can give.

One feature of our long distance service that has brought us business is the quickness with which calls are put through. This is one reason why our service is becoming so popular. In Sioux City our gross business has increased over one thousand per cent. in the six months we have been operating there. At that, we do not believe that we are getting more than ten per cent. of the toll business. But we are making every effort to increase this percentage, and we believe that at the next convention we

will be able to report a better showing in regard to our share of the toll business, but we want your help, and by helping us you can also help yourself materially.

In a very short time we will have splendid connections with St. Louis, Kansas City, St. Joseph, Topeka, Council Bluffs, South Omaha, Lincoln and other Nebraska points. At the present time we reach Sioux Falls, Yankton, Duluth, St. Paul and Minneapolis. By the middle of the summer, a number eight copper circuit will be strung from St. Paul to St. Louis, and no one need be ashamed of the service this line will give, either.

I will conclude this paper with an earnest appeal to you all, to improve your toll lines. Let us weed out all grounded and barb wire lines from our maps of toll lines and only show and use such lines as we know will give perfect satisfaction.

[Read at the meeting of Independent Telephone men at Des Moines, Iowa. Mr. Smith is secretary of the New State Telephone Company, Sioux City, Iowa.]

## Pole Lines for Aerial Cable

G. J. NEWTON.

Where the conditions in a town do not justify the building of a complete underground system the cables can be extended aerial and a system of block distribution still maintained, by either entering the blocks through driveways, between or on buildings or where necessary, underground.

In building pole lines for cable it will seldom be necessary to use poles higher than 35 feet and 25 or 30 foot poles will generally be found better as the cable will be below the branches of the trees in residence districts.

In laying out a pole line for this purpose it must be remembered that the strain is heavy and sections must be short and poles set in such a manner that all curves and corners can be securely guyed; in fact the ability to guy will determine the location of the poles very much unless steel or self supporting poles are used.

The matter of guying is one which must be given careful consideration and if properly done will result in holding the line in place, leaving no sagging cable and poles pulled out of line. While a cable is not subjected to the same wind pressure that an open wire line is, still in times of sleet a very material extra weight is added and this fact must be taken in consideration in the selection of both messenger wire and guy wire.

The practice of guying to trees is not recommended as in heavy winds the largest trees will move and every slight lessening of the strain on the guy will be taken up by weight of the cable. Where a tree guy is necessary the tree is to be protected by tree-blocks as shown in Fig. 1 which should be painted a dark green to make them as inconspicuous as possible. Number 12 or No. 14 iron wire is run through the holes "A" and "B" of sufficient blocks to circle the tree and is put in place similar to a belt. Using the wires in this manner saves fastening the blocks to the trees with nails and the use of the blocks will generally win the consent of the property owner to place a guy on the tree. Fig. 2 shows the blocks and guy in place.

Whenever possible all guys should be anchor guys, using a stub where it is necessary to cross roads with the guy; but where stubs are used they are to be securely anchored. In the selection of anchors, there are several patent ones to choose from; but I prefer an anchor rod and slug for all heavy strains and for extra heavy strains use a three-quarter inch or seven-eighth inch rod from pole to slug having a turn-buckle in the center.

There is one point that should be mentioned in connection with anchor rods or turn-buckle guys having threaded ends, and that is that before the rods are threaded the iron should be "upset" or enlarged for the



distance that the thread is to be cut so that the rod will not be weakened by the thread. All iron work should be thoroughly galvanized and subjected to the tests adopted by the leading companies.

Frequently when subjected to heavy strains the ordinary guy clamps will slip, there is, however, a clamp now made in which the grooves are corrugated, this clamp being far superior to the old style and will give perfect satisfaction.

Referring to Fig 3.

A-A are guy clamps.

B-B wire rope thimbles.

C is a five-eighth inch machine bolt that passes through band D and the pole.

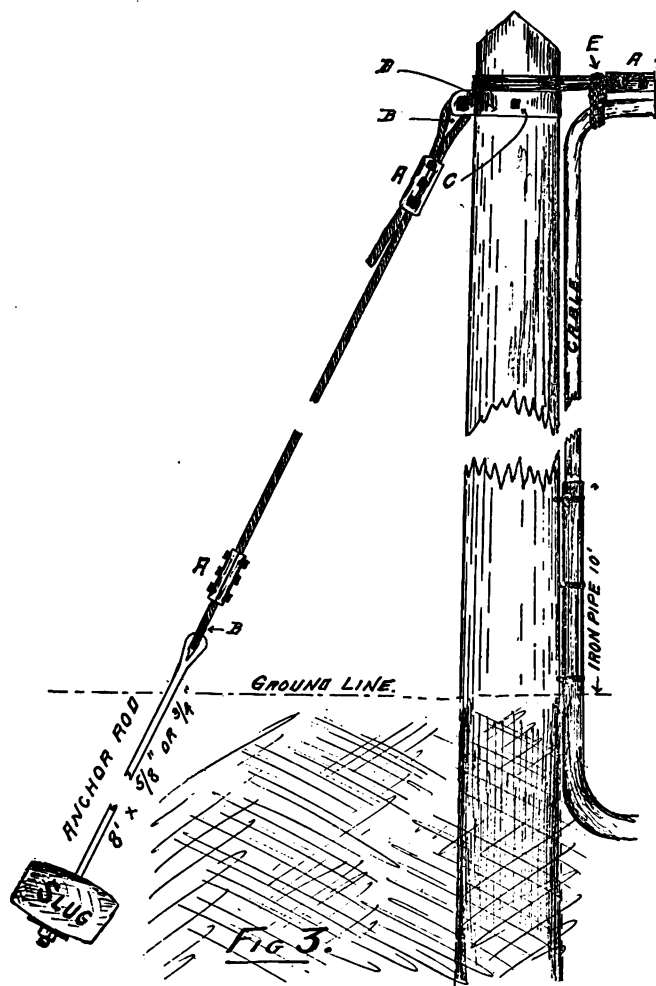
E is a lashing of marline at the cable bend. Iron pipes should extend up the pole ten feet from the ground and from that point to the bend in the cable; the cable should be covered with wooden moulding which is fastened over the cable with galvanized pipe straps. This moulding

can be made in different sizes to fit the cable and by using two pieces of the top moulding where the aerial cable passes under electric light wires the cable will be protected from damage by a broken wire. To prevent the guys and messenger wire cutting into the pole it is a good plan to armor the pole at this point with strips of galvanized iron 6 inches by 1 inch by  $\frac{1}{4}$  inch, similar to the method of using tree blocks except that the irons have a hole punched in each end and are held in place by nails.

The ends of all guys outside of guy clamps should be secured to the standing part and not left loose as shown in Fig 3.

Iron pipes for pole ends should be given a good coat of Asphaltum paint, also turn-buckle guys and pole bands and all special ironwork that can not be had galvanized.

Messenger clamps may be fastened with lag bolts for light cable but should be bolted to the pole with five-



eighth inch through bolts for heavy cable, using washers on back of pole.

#### POLES.

All poles for this kind of work should be of the very best quality, straight, carefully shaved and roofed and painted one coat of dark green paint in the yard before being delivered. There is nothing that will attract attention quicker than a line of new poles up a street and as the poles should be painted anyway it is a good plan

to put on one coat first. On straight lines poles should be set five feet in the ground and deeper on curves and corners where extra heavy poles should be set and given a slight lean. All holes are to be of sufficient size to admit the butt of pole without trimming and to leave ample room to use tampers on all sides, the earth to be firmly tamped in; not less than three tampers for one shovel being used and this rule should be insisted on.

Poles should be set on property lines wherever possible as they will be less objectionable there and at the same time be in better position to lead a block cable in from.

Where the digging is good and eighty to one hundred holes a day dug, it is advisable to use a pole raising derrick wagon, as with this equipment eight to ten men and a team can set this number of poles, but twenty-five or thirty foot poles can be handled nearly as fast by the men without the wagon. There is no doubt, however, that where there are a great many poles to be set that the derrick will do the work cheaper, and as this is not an expensive arrangement and can be purchased complete or made anywhere, there seems no good reason for a company not being provided with one.

After the poles are set the guys should be put on and held by the clamps; but the guys are not to be made up permanently on the ground end until the messenger wire is run and pulled up as it may be necessary to pull up some guys more or slack others off; the messenger wire should be dead ended around the pole at each end, using guy clamps and serving the outer end the same as the guys.

If it is desired to ground the cable and messenger wire at various points these ground wires should be fastened to the pole (leaving a coil on the bottom of pole) before the pole is set.

In selecting messenger wire to support the cable you must take in consideration the length of the spans and the weight of the cable per foot; ordinary three-eighth inch seven strand wire will support safely one and one-half pounds per foot in a section 110 feet long; while the extra high strength messenger wire of the same size will support three or four times this weight in the same length of span.

It is not advisable to use a smaller size messenger wire than three-eighth inch, as anything less than this is not safe to send a man over, which is frequently necessary.

W. L. Porterfield, of Long Beach, Cal., president of the Long Beach Home Telephone Company and principal owner of the exchanges of San Pedro, Santa Ana, San Bernardino, Ventura, Upland, Highland, Ontario, Corona and Colton, sold all of his holdings June 1st to a number of Los Angeles men, headed by J. M. C. Marble, for a consideration of \$1,350,000.

Manager Spafford of the Peoples' Telephone Company, Haverhill, Mass., says plans have been perfected whereby Independent Telephone Companies will branch out and compete with the Bell companies throughout New England. A petition for a franchise has been submitted to the city council of Boston and similar petitions are pending in Lawrence and Lowell, Mass. Mr. Spafford says, Western interests have become identified with Independent telephone projects in New England. With the franchises already secured it is proposed to build trunk lines to secure links between the various municipalities.

# Forcing Collections.

F. V. NEWMAN, GRAND RAPIDS, MICH.

When Independent telephone companies were first established, it was necessary owing to conditions, to secure the largest number of subscribers available. Consequently, not enough attention could be given to the work of systemizing and forcing collections.

In the rush for new subscribers, it often occurred that the financial liability of many of the subscribers secured, was such that they were unable to meet promptly the rentals when due. The Citizens Company has now made arrangements with the local Credit Company to furnish a report when in doubt of the financial standing of new applicants. This has proven a good investment. We have found it necessary to insist on payment of the first quarter's rental before any work is done toward the installation of the service.

It has been demonstrated that we have already saved enough money, by refusing to make installations, to pay the cost of obtaining reports from the credit agency. If the Credit Company's report is unfavorable, and the subscriber does not pay the quarter's rental in advance, the application is cancelled. If one quarter's rental is paid promptly in advance, the information furnished by the Credit Company is filed for future reference, and is constantly reviewed to see that the subscriber's payments are promptly made.

This has given us a mint of valuable information, and put us in a position where we are in constant touch with the subscriber's financial conditions.

New companies, now starting, as a rule adopt the plan of allowing a discount for payments made at office for rentals in advance. It might be interesting to know the cost of making collection in the Grand Rapids exchange of the Citizens Company, an exchange of 7470 telephones. The total of the gross rental and toll service per annum was about \$250,000.00 for the year of 1905, the cost of collections was about 2 per cent of the whole amount.

If the Citizens Telephone Company had in vogue the discount plan at the present time, with the present rates in force, it would be at a loss. Persons who avail themselves of the discount are the people who pay the bill on presentation by the collector. If the Citizens Telephone Company were even to allow a discount of 2 per cent., the cost of making collections would be increased, as even with the discount plan, it is necessary to engage a certain number of collectors to force the slow or delinquent subscribers to pay. Also to collect amounts due after telephones have been discontinued, and to this must be added the cost of mailing and collecting of toll bills under the discount plan.

During the month of January, 1905, 53 per cent. of the whole amount of rental and toll earnings for the Grand Rapids exchange was collected. During the quarter 85 per cent. of the whole amount was collected. During the month of January, 1906, the first month of the quarter one year later, 64 per cent. of the amount was collected, an increase for one year of 11 per cent. This was done through good systematic efforts on the part of the collection department, with the co-operation of the management of the company.

We believe it is advisable, unless special request is made to mail same, to render all bills. It is customary to

have the bills arranged according to routes in the city before the collector leaves the office, and a record is made of the amount due. If a settlement is made on presentation the same is noted. The object of this is to give the collector a complete record of all collections due in his respective district.

If any collector receives an appointment to pay at a certain date, a memoranda is made of the same and filed in the office. The importance of the collector calling on the date set is urged very strongly, in order that the subscriber may have no excuses.

In the middle of the quarter a written demand is made for settlement for subscribers who have not paid accounts due. This is followed a little later with a written request that payment be made on a certain date, in order to insure continuance of the service.

During the year of 1905 there were discontinued fifty-five subscribers telephones connected with the Grand Rapids exchange for non-payment. From January 1st, 1906, up to the present date this year, there were discontinued eleven telephones.

In the collection department a switchboard is located, where delinquent subscribers' lines are connected. If a subscriber does not pay his account, his line is connected on this board, and he is advised that the account must be settled before further out-going service can be furnished. If in a reasonable length of time the account is not paid, the instrument is removed from the subscriber's premises.

It is customary after a subscriber's instrument has been discontinued to present the bill for payment, and if immediate settlement can not be had the account is referred to the local Credit Company for collection. In this way we have been able to realize considerable on accounts, where our regular collectors could not obtain settlement.

The Citizens Company has charged off as uncollectable for the year 1905, at the Grand Rapids exchange, a little less than 1-3 of 1 per cent. of the total rentals and tolls charged, which we consider a very gratifying record. Weekly review meetings are held with the collection department and active management of the company. The accounts due are gone over very carefully, notations made regarding the subscriber's promises, etc. We have found these meetings to be worth their weight in gold, as the collectors appreciate the courtesy of meeting with the management of the company, and it always gives them good encouragement to force collections. At one of the monthly evening meetings, the general manager of the company spent the evening in answering questions put to him by the collectors. These questions consisted of numerous inquiries made by subscribers regarding miscellaneous information desired by them.

As a rule, it is usually the same subscribers who are in arrears. We decided some time ago to take up these special cases and force the prompt payment of rentals. The collectors were requested to hand in a list of these subscribers who were notified that they would have to pay promptly. We have found this a good plan, as a large per cent. of the subscribers who formerly did not pay until the latter part of the quarter, are now paying promptly in advance. This has all been accomplished



without any antagonistic feeling on the part of the subscriber toward the telephone company.

Considering the increase in business the last year of 17 per cent., today the outstanding debt of the Grand Rapids exchange is lower than it has ever been. Many telephone companies do not consider carefully, the importance of the collections. Schools for education of operators and solicitors are maintained by certain companies; why not have a school for the education of the collector, who comes closer to the subscriber than the management of the company?

If you expect good results, you must keep constantly in touch with the collections and offer encouragement in the way of a fair salary to collectors. Usually, when an employe makes a success in the collection department, his services are considered valuable for this department only, and he is not given an opportunity to grow up in the electrical or mechanical end of the business.

Good results to force collections have been obtained in the outside exchanges by the Citizens Telephone Company, and a card record system is kept of the collections. These are compared by the general manager, and if any indication is shown that the collections are going behind, the matter is immediately brought to the attention of the local manager.

We have also tried the experiment of sending to the outside exchanges, an experienced collector to take up delinquent accounts and have found this a good plan.

The local manager as a rule, is inclined to be lax in forcing collections, as there are numerous other duties that demand his attention, and also the deadly, dull routine of collections and making of reports are not very inviting duties.

I recall where we had an exchange of about seventy-five telephones and a commissioned manager in charge. We impressed on him the importance of forcing collections. He would always respond by stating "the subscribers did not care to pay in advance."

Recently management of the office was changed and a

large number of the subscribers added and a salaried manager assumed charge of the office. The bills were presented promptly and about 95 per cent. of the collections were made during the first month of the quarter. Local managers are now asked, what is there outstanding? instead of "how many subscribers has your exchange?"

This all has a tendency to show that if you have the tenacity to stick to it, you can force the collections. We all realize that it is a great deal easier to collect rental and toll charges when they are due, especially toll bills. If allowed to accumulate, it is harder to force the collections, as the subscribers as a rule, seem to consider that the telephone company has an abundance of capital and is not in a great need of the money.

We have spent some time in educating the collectors as to how the toll calls are recorded and forwarded to the line operators and the routine work, in order that they can easily discuss with the subscribers any question regarding a toll charge that may arise. Often the subscriber claims that the call did not originate at his telephone, or that he was positive that he had not talked overtime, as charged.

In the collection department a blackboard is placed, on which is noted the amount of monies collected in the same period for the previous quarter, also the names of each collector, the amounts collected daily by the individual collector is posted opposite their names and each morning the collectors know if the collections are up to the previous record.

It is surprising to know with what interest the collectors' eyes scan the board when the amounts are posted. This stimulates the activity of the collector to reduce the outstanding and promote a healthy competition between collectors that brings good results to the company.

[Read at telephone convention, Ann Arbor, Mich., March 22, 1901. Mr. Newman is manager of the Citizens Exchange of Grand Rapids.]

## Daily Collection Record System For Large Exchanges.

By CHAS. C. WILMOT, Telephone Accountant.

The following described system of handling collections has been installed in quite a number of large exchanges with most satisfactory results:

**DAILY COLLECTION SHEET, FORM G-14, For Office Collections:**—This sheet is to be used as a record upon which to enter any cash payments made at the office by patrons of company for rentals, tolls or other charges, entries made from the coupons of rental and toll bills after same have been sorted, enter name of exchange, the date, and on blank line marked "Collector," write office collections.

**COLLECTOR'S DAILY REPORT:**—Collectors are to make up their daily reports on this form, first sorting their "cashiers' coupons" by numerical telephone numbers, writing in the name, period paid for and distribute the amount of payments into rental, toll or miscellaneous columns according to the nature of the bill collected.

Where payment is made by check, it would be well to write word "check" on line of entry. Toll and rental

rebates entered on these sheets must be marked O. K. by a Manager or some one in authority. Enter in column headed "Petty Ledger" any collections for delinquent or suspense accounts which have been taken out of regular subscribers' ledger and transferred to an auxiliary ledger kept for this class of accounts.

Each collector should list his count of cash turned in on back of this form for cashier to "check off" by and for future reference, should any dispute over shortage arise.

Cashier or bookkeeper should number these collection sheets from No. 1 up, for each day's work, in posting entries from these sheets to subscribers' ledger accounts the date and number of sheet should be given on ledger. When these sheets are fully posted and verified this fact should be "checked in" on the proper spaces at upper right hand corner and sheets filed away (face side down) in a cheap loose leaf post binder provided for the purpose, inserting a plain manila index sheet between each day's work; this index sheet is made a little wider than form, giving space on the projecting edge to note the month and day of month so that ready reference can be had to any specific day's record, at once.

Footings should be verified, sheets duly paged and the office and each collector's collections for the day, should be entered by totals on general cash record and

With this method and form, a six months or yearly audit of the cash receipts of a large exchange or system can be made and verified in a very short time.

CHRISTIAN COUNTY TELEPHONE COMPANY.										SHEET NO. _____	
DAILY COLLECTION SHEET.										ENTERED DAILY CASH REG. SHEET.	
EXCHANGE _____										NO. 1 NO. 2 NO. 3	
190 _____										POSTED BY _____	
										FOOTINGS AUDITOR	
										VERIFIED BY _____	
										COLLECTOR _____	
ITEM	TEL. NO.	NAME OF SUBSCRIBER	PERIOD PAID FOR	✓	RENTALS	TOLLS	PETTY LEDGER	MISCELL'S	RENTAL REBATES	TOLL REBATES	BOOK-KEEPER
1		AMOUNTS BROUGHT FORWARD									
2											
3											
4											
23											
24											
31											
TOTALS CARRIED FORWARD			FOOTINGS VERIFIED BY								
RECAPITULATION		RENTAL COLLECTIONS				REMARKS					
		TOLL COLLECTIONS									
		PETTY LEDGER COLLECTIONS									
		MISCELLANEOUS COLLECTIONS									
		TOTAL COLLECTIONS				TOTAL POSTED					

sheets, then turned over to bookkeeper or bookkeepers for posting to each subscriber's account.

\*Editor's Note:—Mr. Wilmont is manager of the Telephone System's Dept. of the Edwards-Hine Co., Grand Rapids, Mich.

## How Important is a Clearing House to Any Organization?

GEO. T. HEWES

Clearing—Webster:—

1. Act or process of making clear.
2. A tract of land cleared of wood for cultivation.
3. A method adopted by banks and bankers for making an exchange of checks held by each against others and settling differences of account. In England a similar method has been adopted by railroads for adjusting their accounts with each other.
4. The gross amount of the balances adjusted in the Clearing House. Clearing House, the establishment where the business of clearing is carried on.

The foregoing definition of the word Clearing House according to Webster pre-supposes that its dealings are entirely financial. Your committee in selecting this name chose wisely. The only question which confronts the Iowa Independent man to-day is a financial one. Like the Iowa farmer, after well cultivating his field and planting his crops, he halts for a moment as the grain ripens and contemplates, how shall I proceed to garner in the fruit of my labor? What shall the harvest be? Let us for a moment glance at the report of the Bureau of the Census for 1902, and endeavor to comprehend if possible, the magnitude of the long distance toll business as it relates to that feature, which is one of the most importance to us. The number of long distance or toll messages transmitted during the year, I would suggest that you can with safety increase them at least 40 per cent. and

still be within the limits of the business transacted through the same territory for the year 1905, just closed. The total long distance and toll talks for the United States is enumerated as being 120,704,844 during the year 1902. The state of Pennsylvania having to her credit during this period.....20,409,621  
New York .....20,367,024  
Indiana .... 4,078,062  
Iowa .... 3,298,094

Referring to table No. 36 of the before-mentioned Census report, under the heading of the Number of Public Exchanges, Bell and Independent Systems by States and Territories, we find that the State of Iowa is credited with 710 exchanges, 68 of which are Bell, 642 Independent. These figures as regards the total number of Independent exchanges are only exceeded by one other State, namely, Illinois, and the ratio between the Independent and Bell is not exceeded by any other State in the Union.

Referring to table No. 10 covering All Systems—Average Number of Messages, Expense, and Income Per Telephone by States and Territories, 1902, we find that Iowa under the reading of Operating Expenses is reported, representing the lowest average per telephone per year, namely \$10.53, which is compared as follows: Illinois .....23.73

Pennsylvania .....	28.91
New York .....	39.79

The fixed charges in these respective states are as follows:

Iowa.....	1.15 per annum per telephone
Illinois.....	2.49 per annum per telephone
New York.....	4.66 per annum per telephone
Pennsylvania.....	4.94 per annum per telephone

The net income:

Iowa.....	4.67 per annum per telephone
Illinois.....	8.39 per annum per telephone
New York.....	20.02 per annum per telephone
Pennsylvania.....	9.48 per annum per telephone

The conclusion is that, we Iowans are putting more personal effort in the management and operation of our business, than any similar organization in the states mentioned; that our investment per telephone is less; and that our income is the least. Does not this demonstrate that there is something radically wrong? Does this not confirm the statement that we are giving more for the money than any other state? It has been conceded that our telephone rates for services per telephone are the lowest in the United States. Twenty-two per cent. of the Rural phones of the entire United States are located in Iowa.

Taking the figures submitted to the Executive Council of Iowa for taxation purposes, we find that the total number of telephones reported for the year ending July 31st, 1905, including the Rural and Farm Telephones aggregate 13,881; and our only competitor, the Bell, have reported 27,260. It may surprise you to know that the several Independent Telephone Companies of the State have reported 5,056.40 miles of copper wire, while the Bell Company have reported 6,113.98. During the last eight months, there has been considerable activity throughout the State in the development of toll lines. There having been a greater number of miles of copper toll lines constructed during the last eight months than during any two preceding years in the history of the Independent movement. Two exchanges of large capacities have been built, details of which are not included in the report from the Executive Council, before mentioned, namely, Sioux City and Council Bluffs, also the rebuilding of the Corn Belt Company's exchange at Waterloo, which altogether represent an investment of \$500,000, with an aggregate of 5,000 additional telephones. These exchanges all are constructed according to the most modern methods known to the art of telephone construction, both aerial and underground. The New State Telephone Company, headquarters at Sioux City, have built upwards of 300 miles of No. 10 copper toll line which has opened up communication between twenty and twenty-five thousand Independent Telephones, which were never before able to communicate with each other.

You may ask of what significance are these facts to the subject of this article, the Clearing House. I answer that they are of vital importance as they will enable you to comprehend the vast extent of the Independent Telephone field. I also ask if the time is ripe for the inauguration of the Clearing House, for the Independent Telephone Companies and will endeavor to assist you to correctly answer this question for yourselves by outlining a few of the benefits to be derived by your association with the Clearing House. A survey of the methods to be pursued by the Clearing House in the handling of your business should be brought to your attention.

Immediately after the inauguration of the National

Independent Telephone Association, it was necessary for them to procure maps of all the Independent Telephone lines throughout the Country. This has been a very severe task. The Clearing House desires to assist them in this matter to the extent of asking all Independent Telephone Companies of Iowa who have not yet furnished the National Association with their maps to forward them to the Clearing House at Des Moines. Arrangements are being made whereby all of the maps now in our possession shall be copied and forwarded to the National Association.

The next important step as outlined by the National Telephone Association is that of adopting standard forms of accounting, likewise, it has been the duty of the Clearing House which has already been perfected, the adoption of a standard toll ticket. The distinguishing feature of which is the exchange of the serial number which is printed on each ticket, "Out," "In," and "Through," between operators at the inception of a long distance connection. This feature when properly carried out and the record of the check number of the "Out" ticket having been made, at the station called on the "In" ticket reduces the possibility of errors to a minimum, both in the amount of money received for the toll talk and the names and addresses of the parties against whom the toll charges are charged. It is hoped that the errors by the use of this system of tickets will be reduced below the average, which has in some cases been placed at 11 per cent. and if this is possible the expense of clearing these tickets through the Clearing House will be greatly reduced in the future over the present method, as it may be possible, by dealing with the several summary reports from the several toll line companies to regard only the totals of the business exchanged between the respective companies.

A question naturally arises, why is it that this system of toll accounting has not been adopted by other telephone Toll line companies in the past, and I may answer that the peculiar circumstances governing the Independent Telephone long distance messages up to date are radically different from the methods of other Companies. For instance, a toll line conversation takes place between Des Moines and Sioux City, over the Independent line, at the present moment requires the use of several miles of copper toll line owned by by several different telephone companies. For instances, Des Moines rings Ft. Dodge, Ft. Dodge rings Cherokee, and Cherokee rings Sioux City. Immediately there is a copper circuit electrically connected extending over a distance by circuitous routes of \_\_\_\_\_ miles. There are four companies who have expended large sums of money toward the erection and maintenance of these lines and in order to justify the investment on the part of these several companies they must be assured beyond any question of doubt that they will receive each his pro-rata share of each toll charge from terminal point to terminal point. A talk between Des Moines and Sioux City will bring into the Clearing House to be pro rata the following tickets, an "Out" ticket from Des Moines, a "Through" ticket from Ft. Dodge, a "Through" ticket from Cherokee and an "In" ticket from Sioux City. Each of these tickets will, with their presence in the Clearing House, make a demand for its share of the toll charge and a comparison with each other by means of the serial numbers exchanged between operators will prove conclusively, if properly recorded, that the demand made by the ticket is a just one.

## Development of Independent Telephony in Mississippi

While up to but very recently the Independent telephone systems in Mississippi were upon a weak and limited basis, as compared with the development of Independent telephony in many other states, there is, however, at the present time, a movement started which will bring the Independent telephone systems of that state among the foremost in the ranks of the business.

That the telephone field in that state is an attractive one when carried out on a large scale with long distance toll service, is indicated by the fact that the Southern Bell Company in the past have maintained their mon-

without waiting to secure a list of contracts, began immediately to send in material for building a thoroughly modern and high-class plant. The construction work was placed in charge of Mr. C. B. Luck as superintendent and T. J. Wetsel as general foreman.

As soon as the local business people saw that the new company was not organized for the purpose only of selling securities at a discount before a plant could be built, but that they were fully financed on a good business basis and were making rapid progress in building a plant at a cost of several hundred thousand dollars, they soon became convinced that the plant was being built as a per-

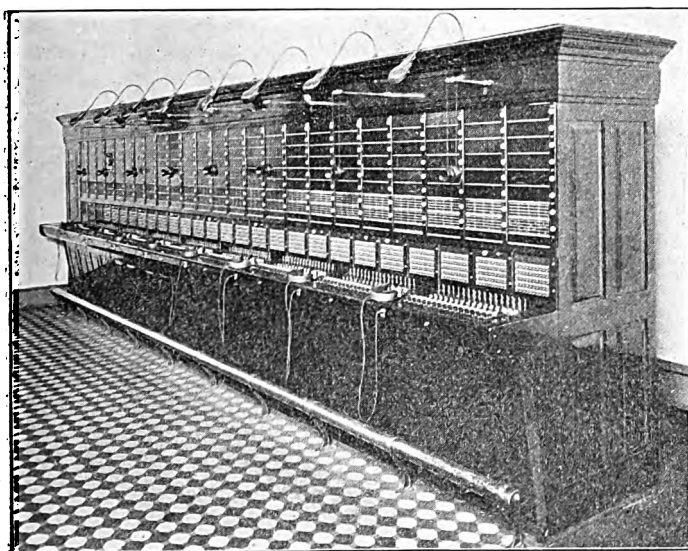
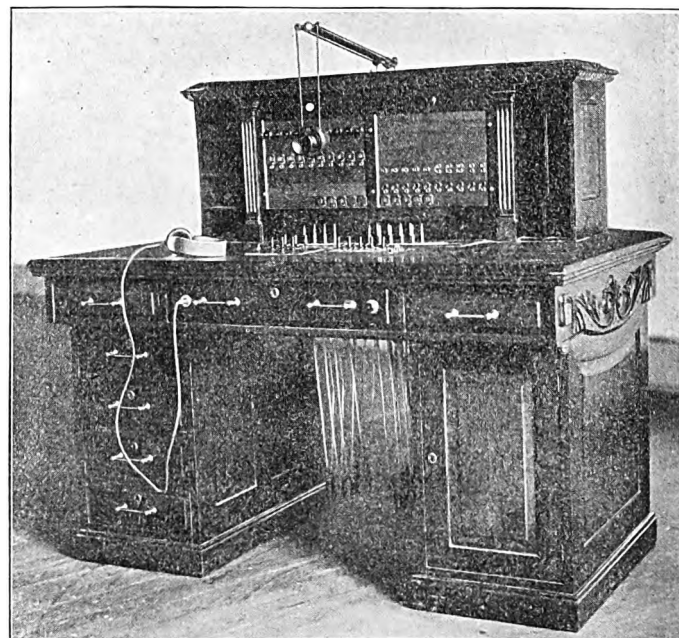


FIG. 1, MAIN EXCHANGE SWITCHBOARD.



WIRE CHIEF'S DESK.

opoly only by purchasing frequently at a high price, most of the earlier established Independent systems.

The Meridian Home Telephone Company and the Rural Long Distance Telephone Co., organized some time ago, which have recently completed their systems at Meridian, are now rapidly extending their long distance service and establishing local exchanges throughout the state.

These companies started in one of the most guarded strongholds of the Southern Bell Company and, having made a complete success at this point, they are placed in full command of the situation in that section. Meridian has a population of about 22,000 and is the largest inland cotton center in the world, and one of the most progressive cities in the south.

A number of Independent telephone franchises having been previously granted by the city, and one exchange having been established and operated for a time, all of which were bought up by the Bell company, made the city officials and also the business people very skeptical of Independent telephony.

Messrs. Jones and Winter, telephone engineers and contractors of Chicago, about a year ago, on the invitation of some of the prominent citizens who were thoroughly satisfied as to their success in building telephone plants in the past, secured a franchise at one sitting, and

manent investment and a permanent system, and readily supported the new company by sending in their service contracts.

The underground area was rather large for a town of this size, consisting of over four miles of trenching, in which were laid something like 100,000 feet of three-inch Bituminized Fibre conduits; these were laid on and surrounded with three inches of concrete. The man-holes were built with brick sides and concrete tops.

The cable used in this installation was manufactured by the Standard Underground Cable Co., of Pittsburg, double wrap dry paper insulated heavy lead-encased cables from 50 to 350 pairs being used.

Distribution in the underground district was accomplished from poles in the alleys—Frank B. Cook's S. W. terminals being used throughout.

The poles used in this work were selected juniper, 30 to 55 feet in length—the cross-arms of long-lease yellow standard 3¼ by 4¼ inch ten-pin, filled with locust pins.

The aerial construction of this system is largely cable, but where open wires are used they are No. 12 B. & S.

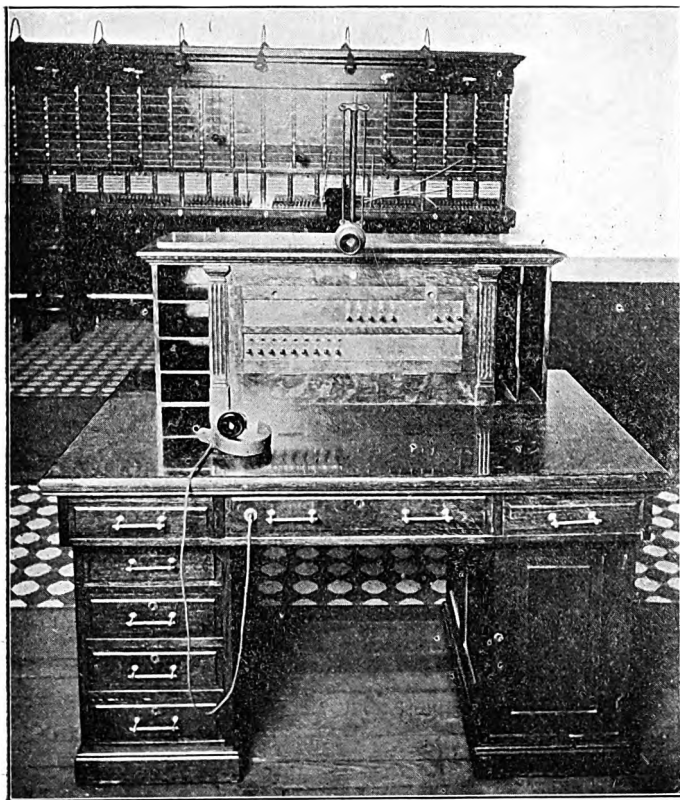


guage, hard drawn copper. The guying of the aerial work has been very carefully considered, the rods taking the messenger strain being  $1\frac{1}{2}$  inches by nine feet in length, and all iron work being galvanized.

The company started operating January 1, 1906, with 1,000 subscribers and have now nearly 1300 telephones in operation.

The system is equipped with the very latest type central energy full major multiple lamp signal switchboard and telephones, manufactured by the International Telephone Mfg. Co., of Chicago.

Fig. 1 shows the main exchange switchboard. The board is built with a multiple capacity and power equipment for 4800 exchange lines, all arranged for from one to four party selective work. The present board equipment consists of 1200 lines, arranged 150 lines to each of eight operators' positions.



CHIEF OPERATOR'S DESK.

The first position is used as a multiple annex to the operator's position containing the first 150 lines, and also contains 10 toll line equipments, extensions of the toll board equipment for night service.

The second to the ninth position, both inclusive, are each equipped with a complete operator's telephone, 16 pairs connecting appliances and 150 exchange line equipments together with the required multiple jacks properly arranged to enable any one operator to make direct connection between any two subscribers' lines without reaching beyond the positions adjoining the one in which the call is received.

Each operator's set consists of a regular central energy transmitter suspended on a pair of single conductor green silk cords, provided with proper pulley weights, and supported by a heavily nickle-plated brass adjustable extension arm provided with oxidized pulleys and hangers, together with induction coil, bi-polar operator's re-

ceiver with head-band, cord, plug and cut-in jack, including one white line pilot and one red supervisory pilot lights with necessary relays and other auxiliary apparatus necessary for the system.

The operators' transmitters are the regular telephone transmitters provided with a special back, strongly constructed of cast brass with the metal parts oxidized. The cord is so fastened in the transmitter as to relieve the conductors from any strain. The pilot lights consist of one-third candle power incandescent lamps, supported in a brass spring collet socket, provided with a brass cup in which is seen the prism or bull's eye, all so arranged that the lamp can readily be removed or placed in position from the front of the board. The lamp jacks are so constructed that the lamps can be inserted only in their required position to make proper contact.

Each operator's position is also provided with the necessary order wire keys connected to the toll board.

Each pair of connecting appliances consists of a pair of two-conductor tinsel and spiral cords, with re-enforcement at the plug end, together with plugs, weights, a combination listening key and four party selective list-



AERIAL CABLE IN CITY.

ening buttons, also a pair of supervisory clearing-out signals with the necessary relays and auxiliary apparatus.

The plugs are constructed so that two or more may be inserted in adjoining jacks built on  $\frac{3}{8}$ -inch centers, and are so proportioned and made to avoid liability of breaking. The shank of the tip end is properly geared so that when forced into the hard rubber insulating tubing there is no possibility of the parts becoming loose or disassembling from ordinary usage. The sleeve of the plug is made of hard fibre smoothly polished, and is held in position by a rim at one end and a nut screwed on the plug from the front end, so that the sleeve is free to turn on the plug body. This avoids weakening the sleeve with a hole, as is necessary when fastening with a set screw, and also prevents kinking and breaking the cord when twisting the plug while inserting. The sleeve clamping nut is provided with a small steel set screw to prevent its turning off. The cord is attached to the plug by turning back one of the conductors and screwing the cord into the body of the plug. The other cord conductor is provided with a round, solid tip to which it is soldered and the tip is inserted into the tube of the tip end of the plug and is firmly clamped by a small set screw. With this connection there is practically no liability of

any of the tinsel short-circuiting the plug. The cord weights are made of lead with stamped brass hangings provided with lignum-vitæ pulleys, and are of the proper weight to keep the cords taut.

The combination listening key and fourparty ringing buttons are self-contained and of the most convenient and approved design and strongly constructed. The springs are accurately punched from highest grade spring German silver sheet and properly formed. They are firmly clamped between mica insulation to a brass base by steel binding screws passing through them, threaded with brass nuts, and insulated with hard rubber bushings. The spring base is supported on metal posts, securely riveted to the top plate, forming a rigid metal frame for the keys. The ringing buttons are of the indicating type and the last key depressed is automatically mechanically restored when another is operated.

The banks of keys are supported on a rigid iron frame, fastened to the key shelf. The key shelves are hinged so they may be conveniently raised for inspecting the keys.

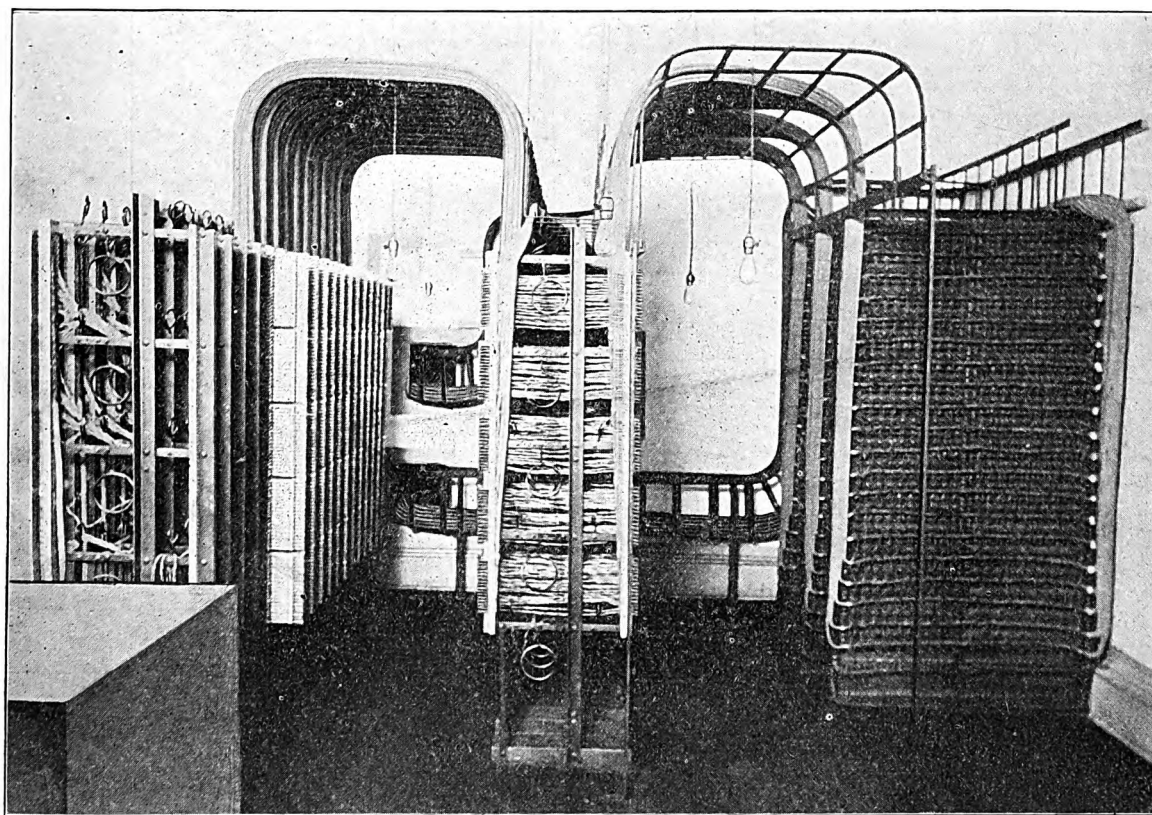
The pilot lights are one-third C. P. lamps, held by a

of a brass supporting base. The springs are firmly clamped between mica insulation to their base by steel binding screws passing through them and threaded in brass nuts with the screws insulated from the frame and springs with hard rubber bushings.

The springs of the answering jacks are stamped from No. 18 spring German silver sheet and are two inches in length. They rest at the plug end against an insulated stop post with a tension in their normal position to give a good plug connection at all times.

The sets of jacks are supported on a steel strip from which they are insulated by a rubber plate, and are clamped by the ferrule of the jack which passes through the steel plate, through rubber insulating bushings and screw into the jack base from the front.

The line lamps are one-third C. P. and are held in a brass spring collet socket provided with an opalescent disc, and is inserted into the jack from the front of the board. The jack springs are so constructed that the lamp can be inserted only so that it will make proper connection. The strips are fastened to the iron frame-work of the board from the front by heavy binding screws. The



TERMINAL ROOM.

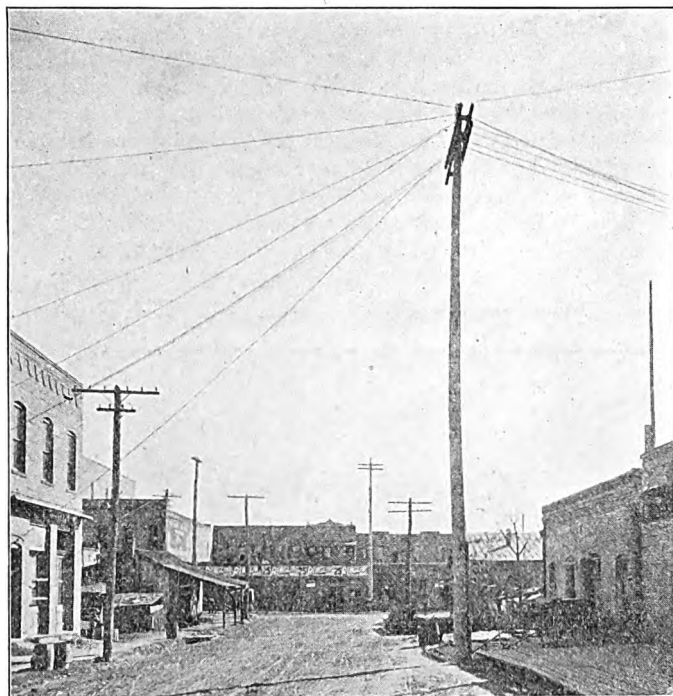
brass spring collet socket which is provided with an opal, protected by an arched wire guard. This form of guard makes an efficient protection to the opal against impact of the plugs, and also provides a means for readily removing the lamp from the top of the board, and at the same time avoids the accumulation of dust over the lamp or opal.

The plug-board and the panel back of the plug-board are covered with heavy sole leather. The line lamp jacks and answering jacks are mounted in sets, with ten sets per strip. The springs of the lamp jacks and the springs of the answering jacks, are mounted on opposite sides

screws and end of the strips are covered by a neat wood strip of the same finish as the cabinet-work. Immediately above the line signals in each position, are mounted the pilot lights. Above the line lamp panels are located the multiple panels, arranged eight to each three positions.

In the lower part of the multiple panel, space is provided for future trunking jacks, twenty of which are installed in each section. Above the trunk panels are placed the multiple jacks, duplicated in every six panels of the eight-panel sections, making the required reach of the operators less than an adjoining position.

Each multiple jack is arranged so that it may be provided with a designating plug to denote whether the jack is on a one, two, three or four party line. The jacks are built in strips of twenty, each on  $\frac{3}{8}$ -inch centers. The springs of the multiple jacks are fully two inches in length, punched out of No. 18 highest grade spring German silver sheet, and having the plug end resting on an insulated stop to give them tension in their normal position to always insure a positive plug connection. The springs are firmly clamped between mica insulation to



a strong, metal base by steel binding screws passing through them and threading into brass nuts. The screws are properly insulated with hard rubber bushings. The metal base is securely riveted to rigid posts extending from the front metal rail, forming a strong and substantial metallic frame for the spring jacks. The busy test connector is clamped to the strip base with the jack springs, having its front end set into milled slots in the rail insulating rubber strip, to which it is firmly clamped together with the metal rail and the rubber face plate by the ferrule which screws into the test connection from

the front. This construction makes a strip of jacks in which breakage, disarrangement of parts or wear is almost impossible, excepting the wearing of the jack ferrule from long continued use. This part can, however, be readily unscrewed and replaced from the front of the board, without removing or disturbing any other part. The strips of multiple jacks are fastened into the frame, the same as the line jacks. The unoccupied space in the board is filled in with quarter-sawn oak panels of the same finish as the cabinet-work.



The frame of the board is in three sections of three positions each. Each section is a self-supporting iron frame, strongly braced and securely bolted and riveted, to make all parts rigid. The face and ends of the frame are covered with quarter-sawn oak cabinet-work, finished in golden oak. The rear of the board is properly closed with paneled sliding doors.

The chief operator's desk shown in cut is of the cordless type which allows of much more rapid operation than the usual method of using cord, plugs and jacks.

(To be continued.)

## Talks and Queries

### A Loose Connection.

EDITOR SOUND WAVES: We have two sets of two cells each of storage batteries which we use alternately on transfer visuals and operators transmitters. We first charge one, then the other, while using the opposite set. They will both show the same voltage and the same specific gravity at a given time, but throwing No. 1 set on makes the switchboards noisy, but if we throw set number one off and set number two on, the boards become quiet. The noise is a kind of a grating or scratch. I have looked for loose connections, and have renewed the electrolyte and have cleaned the battery plates, but the noise still exists. If you could give me a hint in a few words I will be very thankful.

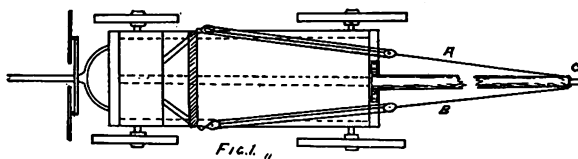
We are very much afraid that you have a loose connection that has baffled you in your search. The fact that the one set of batteries does not cause trouble would make us believe that the trouble must be some place between

the throw-over switch and the set of batteries which give the trouble. It is a little hard to give you a very specific explanation of how to go at the finding of the trouble because you have not given us a diagram of all the apparatus that is in the circuit. We presume that the discharge or throw-over switch is of the double-throw double-pole type and that the discharging batteries are entirely disconnected from the other set when in use. The chances are that you can trace the trouble by means of a receiver. With the defective set thrown on, connect the receiver so that one terminal is attached to a switch lever and the other terminal to the battery wire just before it enters the switch binding post. If the grating noise is heard, the trouble is between the two points of contact, caused either because the switch lever does not fit in the jaw or because the wire is not tightly connected.

Then make the same test on the other side of the switch. If the switch and its connections are all right then test between the last point of attachment and the nearest lug on the battery, being careful to make the connection well and at a point removed from the point of connection so as to have the battery connection between the testing terminals. Then connect the test points across one of the cells and then across the other. By connecting the test points around each joint in the circuit you will easily be able to locate just where the trouble. Where ever you hear the grating noise you may depend upon it that there is a defect between the two test points. The chances are that it is trouble in the switch contacts unless you have a very good knife switch. If not in the switch you will probably find that you have not joined the lugs of the battery properly. The lead should be very carefully cleaned and then tightly joined before the surfaces can have a chance to oxidize.

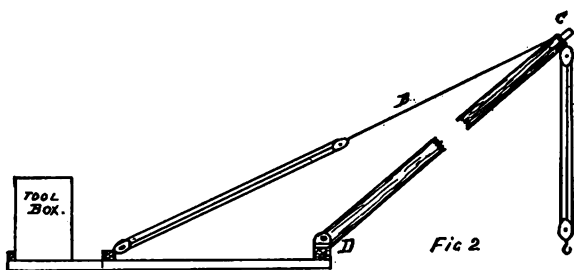
### Pole Raising Derrick.

Some time ago one of our readers from Cuba wrote to us for a description of the method of making a pole raising derrick. At that time we were not in position to write very intelligently on the subject so after making inquiry among our contributors we received the following from Mr. G. J. Newton.



Editor SOUND WAVES: Enclosed find sketch of a pole derrick. I have not had the chance to see the one I had in mind but you know every man who uses them has his own way of making them, but the idea is the same in all cases.

The most trouble with those who have not used them is that they forget that the stress is mostly downward, and as long as the derrick has a good foundation and supporting guys, the weight of the pole being raised will hold the derrick safely. The following are a few suggestions relating to the accompanying sketches Nos. 1 and 2.



1st. The top end of boom C should have a shoulder cut on it, so that the guys A and B will rest against it. (Same as stays on a mast.) Iron bands and rings are very uncertain. (My experience at sea has taught me that.)

2d. I would suggest that the guys A and B from the shoulder to the blocks be of wire rope. The two sets of blocks should have enough rope to permit the boom to drop low enough to pass under all overhead wires in going from one place to another.

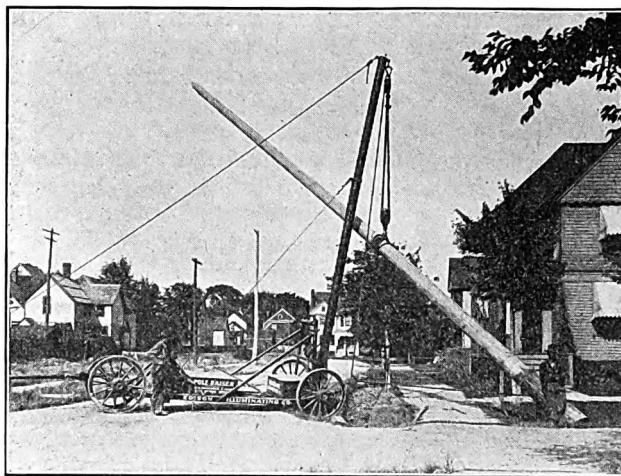
3rd. When in use the boom should be as nearly ver-

tical as possible as there is less chance of tipping the arrangement.

4th. A snatch block should be provided for on either side of the boom near D for leading the hawling part of the hoisting tackle.

5th. There should be an iron band around the lower end of the boom where the bolt passes through, to prevent the boom from splitting.

6th. A low wagon will be found more convenient



A POLE-RAISING WAGON IN OPERATION.

and a tool box, which can be used as a seat, will be found handy.

I do not think the whole thing will cost to exceed seventy-five dollars, and where there are a lot of poles to be set, it would probably save its cost in a short time.

A boom 25 to 30 feet should answer for any poles ordinarily set.

I trust you can get some information out of this stuff."

We certainly can get some good ideas out of this kind explanation and we wish to thank Mr. Newton.

### Concerning Quantity of Current Used.

EDITOR, SOUND WAVES: Please tell me the amount of current that is used by three transmitters (Dean) on our board? We use the same two cells of storage battery on all three transmitters. The Board is busy fifteen hours a day. Please make figures so that I can get current for one transmitter.

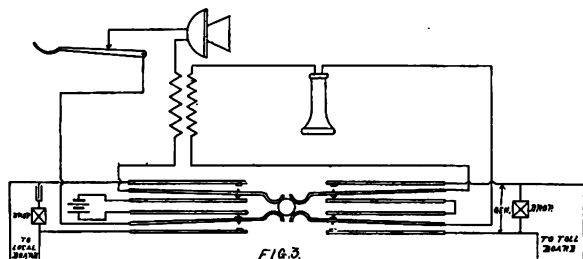
It will be impossible to tell just how much current your transmitters are using without testing with an ammeter. It will depend largely upon the way the instruments are wired, that is, the size of the wire and the length. We will suppose that the transmitter takes an average amount of current and that there is but little loss in the wiring, then each transmitter will take about .12 ampere. Three transmitters will require .36 amperes. In fifteen hours one transmitter will consume  $.12 \times 15 = 1.8$  ampere-hours. The three transmitters will require  $3 \times 1.8$  or 5.4 ampere-hours. To keep the batteries charged there should be a current of one ampere, direct current passed through it for about six hours each day. If you charge direct from a 110 volt direct current lighting circuit, place a 32 candle power lamp in series with the battery while charging.



### Using Phone For Two Circuits.

EDITOR, SOUND WAVES: Here is a diagram of the way a manager can use one phone for two circuits, when one is magneto and the other central energy.

Figure 3 shows the arrangement. When the lever of



the switch is thrown one way the telephone is connected to the magneto line and when thrown the other way the central energy line is in connection.

### Using Generator as Dynamo.

EDITOR, SOUND WAVES: I wish to use a five bar generator as a dynamo to ignite a gasoline engine. Will I have to re-wind the armature? Will it throw a good spark with alternating current, or will I have to use brushes and a commutator? I can remodel it if necessary. Please let me know what change will be necessary.

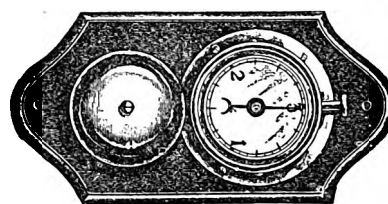
You cannot get good service in any way by changing the magneto generator for sparking purposes unless you can time the generator impulse so as to have the break come at the time the current is at a maximum. You can wind the generator with coarser wire and then add a commutator. In that way you will get a direct current, but there will be two points in each revolution when the

current is zero. At or near those points there will not be sufficient current to explode the gas in the cylinder. You might make it work by using it in connection with a jump spark coil. Wind the armature with No. 24 silk covered magnet wire and you should get a fair voltage with considerable current. It may be that No. 22 wire would give even better service. By driving the generator very fast you could get several sparks from the coil before the piston moved too far.

### Keeping Time on Toll Messages.

It is an easy matter for the operator to keep time on a toll message, but frequently the patron is apt to doubt the time that is shown on his bill. Time flies very rapidly while a person is talking over the telephone and five minutes is apt to appear but two.

To avoid any misunderstanding a clock for registering the duration of toll calls has been placed on the mar-



ket. This clock is placed in a convenient location and when the message is commenced, a button is pressed, which starts the clock. At the end of three minutes an alarm bell rings and thus notifies the talker.

The accompanying cut is an illustration of this little device. The advantage of this piece of apparatus is obvious.

## An Up-to-Date Exchange.

The founders of the Bureau County Independent Telephone Company, Princeton, Ill., were inexperienced in their new field, but they soon realized that the Telephone Business was here to stay, in fact had become a Public Necessity, and at once organized and outlined a policy with the view of not only providing for the immediate needs and demands but of placing it on a conservative business basis that has established confidence and assures permanency.

The Princeton exchange was installed during the winter and spring of 1900, and on May 1st, began to operate and furnish telephone service to a small number of subscribers. From this small beginning the exchange has enlarged and without solicitation the subscribers' list has grown until at the present time there are about 1,000 telephones connected and in operation on this exchange. Considering the size of the city, which has a population of about 4,500, this seems remarkable.

The equipment of the Princeton central and offices becoming too small, the company has within the last year, erected a new and modern building located in the central part of the city. The second floor is being occupied by the company and the first floor will be used as a general merchandise room. New central office equipment has

been installed, the switchboard being a lamp line signal multiple board, and in some respects a more complete



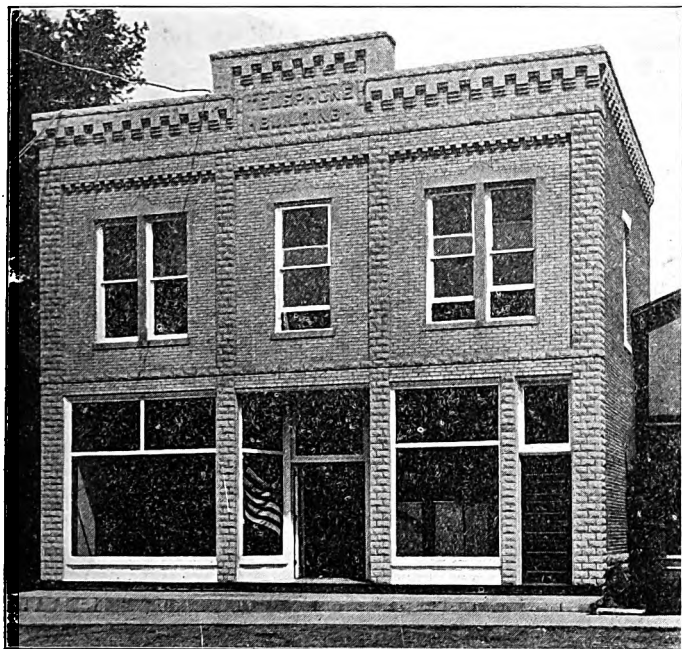
C. O. WHITE, Mgr. Bureau Co. Ind. Tel. Co.

apparatus than is being operated by any independent company in the state. The new feature being that all local

lines, including farm lines, have been extended in full multiple to a two-position toll line switchboard.

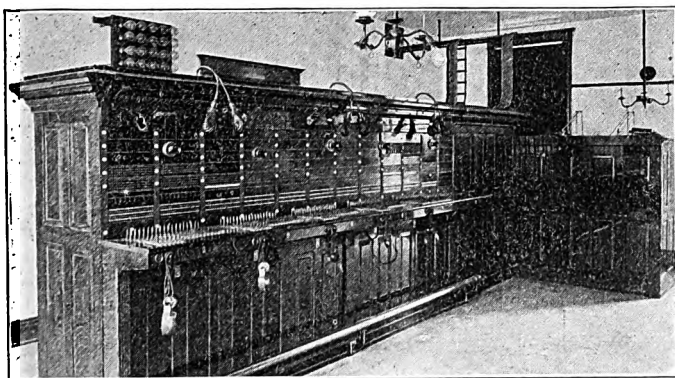
The history and growth of the Bureau County Independent Telephone Company has been interesting. Mr. C. O. White, its present manager, has been with this company since its organization.

The company was first incorporated at Dover, Ills., on Feb. 22nd, 1899, and known as the Dover Telephone Company. The incorporators being, M. H. Blackburn, J. W. Sabin, and C. O. White. The authorized capital stock being \$2,000. Exchanges were installed at La-



HOME OF BUREAU COUNTY, INDEPENDENT CO.

Moille and Dover, Ills., in the fall of 1899, with a toll line connecting the two towns. About the same time a company was organized at Ohio, Ills., under the name of the Ohio Telephone Company, and exchanges at Ohio and Walnut were installed and placed in operation.



SWITCHBOARD, BUREAU COUNTY, INDEPENDENT CO.

The Dover and Ohio companies were consolidated in May, 1900, under the corporate name of the Bureau County Independent Telephone Company, with the home office in Princeton, Illinois.

The stock of the company has been increased from time to time, at present the authorized capital being \$200,000. The company is in every way a home enter-

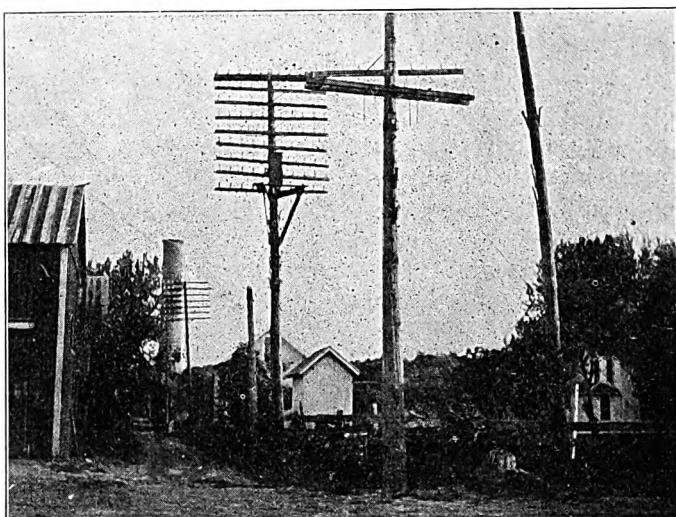
prise, all the stock being held by parties living in the territory covered by the system. It now owns and is operating a system of ten successful exchanges in Bureau county, located as follows: Dover, LaMoille, New Bedford, Ohio, Princeton, Sheffield, Spring Valley, Tiskilwa, Walnut, and Wyanet, and at the present time another exchange is being installed at Ladd, Illinois. The total number of telephones operated on this system is about 4,000, with 300 miles of metallic toll lines, considerable of which is copper.

A new and complete underground system has been installed with a view of making the exchange thoroughly up-to-date in this respect as well as in many others.

At the annual meeting of the stockholders of the company, held on May 1st, the secretary and treasurer's reports show the business of the company to be in a very prosperous condition, many new subscribers having been added during the year.

That the best interests of the company may be conserved, the board of directors is elected from reliable business men throughout the county.

The Stromberg-Carlson Telephone Mfg. Company of Rochester, N. Y., has recently furnished the Bureau County Independent Telephone Company complete new equipment for their exchange at Princeton, Ill.



The main board, at present consisting of two sections, is a lamp line signal, single relay multiple central energy switchboard, having six (6) panels and three (3) operators' positions per section.

Each section is constructed with a well designed iron frame, upon which is placed the cabinet work of quarter-sawn oak. All the woodwork of the different pieces of apparatus has been given a highly polished golden oak finish. The capacity of the board is 1200 central energy lines, 120 trunk lines and 480 answering jacks per section. The present equipment consists of 480 central energy lines, 40 farmer lines terminating on visual signals, and 20 toll lines, terminating on drops in the toll board, but also wired to the night toll position on the main board.

The line relays, together with the cord circuit relays, supervisory pilot relays, and apparatus for operator's equipment are mounted in the rear of the board in a dust-proof relay case where they are readily accessible for inspection. Each operator's position is equipped with eighteen (18) pairs of cords, six (6) of which are com-

bination cords for use on toll to local connections; as the Farmer Lines are multiplied throughout the board, the combination cords become a very important time-saving feature by making it unnecessary to order a farmer line connection.

At present only two-party line service is to be used and each cord circuit is equipped with indicating two-party divided circuit ringing keys, also a master key is installed in each position for use in four-party line service, which the local company intends to install later.

Supervisory pilot lamps are placed on the rail in front of each operator, the white lamp to indicate incoming calls, the red lamp to indicate disconnections on the cord circuits, and the green lamp to indicate when ringing.

The toll board is a four panel, two position board with a calculagraph for measuring elapsed time, mounted between the two operators' positions. This board has a present equipment of twenty (20) toll lines and contains complete multiple of all the central energy and farmer

lines coming into the local board. With the combination cords placed in each operator's position, every connection desired can be made at the toll board. The arrangement for ringing is, of course, the same as at the main board. The toll lines are provided with switching keys to switch these lines to the night toll position on the main board, thus making it possible at night to operate the exchange entirely from the main board.

Two sets of storage batteries are provided, each set of a capacity sufficient to operate the exchange twenty-four hours without recharging, thus ensuing a constant source of power for the exchange.

The impedance coils in the line circuits are mounted on a special rack above the main distributing frame, on which are placed the lightning arresters. The lines are here cross connected and are then carried on cable racks to the distributing frame located in the cable section, which adjoins both the main board and the toll board.

The entire equipment is very compact, flexible and designed in accordance with the dictates of modern practice

## Independents in New York City

D. A. REYNOLDS,

The past year has witnessed more substantial progress in New York City and vicinity than in all the preceding years since Independent telephony has sought a foothold in the metropolis, and although met with strenuous opposition by the monopoly, a substantial footing has been secured which means success.

Two years ago (May 1, 1904) the State Line Telephone Company began building in Dutchess County, where it could connect with other Independent companies, forming the connecting link between the Dutchess County Telephone Company, the Sharron (Conn.) Telephone Company, and the Columbia Telephone Company, the latter having connection with the Albany Home Telephone Company, while the lines of the former connected with the Colonial Telephone Company at Newberg and several small companies west and southwest.

During the past year the State Line Company has finished its system in Columbia, Dutchess and Putnam Counties and expended about \$60,000 in construction in Westchester County on its routes to New York City. Its main exchange in Westchester County is at Peekskill, where the Hudson River Telephone Company (Bell) had 295 subscribers before competition. The Bell system is magneto and the State Line system, S-C central-energy, capacity 1,800, with over 900 subscribers connected. New subscribers are being added at the rate of over 100 a month, with less than 100 business houses now using Bell instruments unconnected with its system.

The State Line has a very comprehensive subway system in the central portion of the municipality, built to accommodate other wires, and the authorities have ordered the Bell wires into the subways of the State Line company. Outside the conduit distinct, the State Line has adopted all-cable construction and block-distribution, and not a cross-arm, brace, pin, glass or unsightly fixture appears in its entire system. It uses S-C 40-volt, switch-board, instruments and cables, Moon terminals throughout, Southern cedar poles, Roebling messenger and Bos-

ton hangers. The plant when complete will have cost about \$40 per telephone, while the Bell system (Magneto) is said to have a capitalization of over \$300 per telephone.

Last May the same interests organized the Great Eastern Telephone Company for developing Great New York, and the Coast Line Telephone Company for developing the adjacent territory in New Jersey, the three companies forming an alliance with the Hubbell interests in Buffalo which has undertaken to supply the metropolitan district with long-distance connection through the Inter-Ocean Company.

Since its organization the Coast Line Telephone company has secured over 23,000 subscribers in the adjacent New Jersey territory (about 7,000 more than the Bell system in the same territory), prepared its maps, profiles and drawings, and now has franchises pending in Jersey City, Newark and Hoboken, and will apply later to the adjacent municipalities.

Prior to the organization of the Great Eastern Company, control had been secured of the New York Electric Lines Company, organized under the telegraph and telephone act of the State of New York in 1882, with a capital of \$5,000,000, to which was granted by the Board of Aldermen in 1883 a franchise for building a conduit system and supplying wires for telegraphing, telephoning and illuminating purpose. This franchise had been the subject of litigation for about eight years, and since 1892 the company had done little more than keep up its organization, pay its taxes and await the demand for additional conduits facilities.

As soon as it was known that the Great Eastern interests had secured control of the New York Electric Lines Company, an action was brought before the Attorney-General to deprive it of its charter granted by the state. It was shown that this so-called "dead" company which the action was brought to "kill," was a very lively corpse, and had not only paid its state taxes, but has been taxed by the City upon its city franchise under the Ford Franchise Tax Law, which is had paid regularly, at one

time submitting to a levy by the city in order to have a court record of recognition.

The Attorney-General decided in favor of the Company on all three points raised by Bell interests, and the validity of its charter was thereby established. It then applied for a permit to begin the construction of its system under its franchise which had been refused, the Corporation Counsel's opinion citing substantially the same reasons urged by the Bell interests in their appearance before the Attorney-General.

Upon the refusal of the Commissioner under such an opinion, mandamus proceedings were at once brought, which are now pending. In this action the Great Eastern interests are represented by Hon. Alton B. Parker, for seven years Chief Justice of the State of New York, Charles W. Dayton, J. Aspinwall Hodge, Ex-Governor Black's firm of Black, Olcott, Gruber & Bonyng, and Frank B. Vermilya, of New York City, and Tracey C. Becker, of Buffalo. It is excepted that the Corporation Counsel's office will be assisted by attorneys favorable to Bell interests and that a decision will be reached in the Supreme Court the present month and a final decision, should the City appeal, sometime in October.

The Great Eastern interests have also secured a majority of the stock of the New York & Eastern Telegraph & Telephone Company, owning the franchise for Brooklyn granted in 1894, which was contested by Bell interests to the Court of Appeals and fully sustained. Permits have been granted to that company under order of the court and in that respect no further litigation is expected.

With franchises insuring the right to build an Independent subway system in both the old cities of New York and Brooklyn, a canvass was instituted by the Great Eastern Telephone Company for 100,000 contracts before beginning the construction of the system, and the company now has something over 107,000 orders (a percentage for lapses) most of which are for five years, showing an annual earning far in excess of \$5,000,000. While most of the contracts are for a single telephone, some of the private branch exchange contracts call for several thousand dollars a year. There are telephone users in New York requiring as high as 600,000 messages a year and employing a private branch exchange as large as some of our small cities.

A complete survey has been made of the entire city embracing over 15,000 blocks, and the data so obtained transmitted to working maps, while other maps show the location of all sewers, conduits, gas and water mains, from which is being prepared the necessary profiles and working drawings for an independent comprehensive conduit system sufficient to accommodate over 600,000 pairs of wires, together with the necessary trunking facilities to accommodate sixty central offices within the greater city with an ultimate average capacity of 10,000 lines to an exchange.

While the Great Eastern interests are developing their plans, the other interests are not altogether idle. The U. S. Independent Telephone Company, known as the Finucane interests, which secured possession of a permit to occupy Bell conduits for burglar alarm wires, but whose charter from the state enabled it to do a telephone business, could it secure the right from the city, still hope to broaden the scope of its permit through political influence until it shall be able to offer telephone competition in the metropolitan district.

The Atlantic, Star and Commonwealth telephone companies have all appeared before the Board of Apportionment in quest of franchises permitting them to occupy Bell conduits, but the Star and Commonwealth have not prosecuted their applications since Engineer Nichols placed a valuation of \$7,750,000 in cash and \$6,000,000 in telephone service as the price for the privilege of occupying Bell conduits for twenty-five years at a rental of \$800 a mile duct, per year, or an annual rental to the monopoly of about \$4,000,000 for duct privileges, with certain confiscation of the plant at the end of twenty-five years.

The Atlantic company, undaunted by this demand, has succeeded in scaling down this valuation until at the present time it proposes to pay to the city \$3,000,000 in cash and about \$6,000,000 in telephone service, while its conduit privilege will cost it nearly \$100,000,000 for the twenty-five year life of the franchise, 90 per cent, of which would go to Bell interests by reason of their control of the Empire City Subway Company.

Recent inquiry fails to disclose any connection between the Atlantic Company and any of the gentlemen whose names stand for independence in the telephone field, while its recent advertisements are certainly along the same lines pursued by the Bell Company. Sometime since, the names of E. L. Barber and Col. J. D. Powers, of Louisville, Ky., were associated with the company, but in the recent re-organization in which the interests of the writer were taken over by Messrs. Campbell and La Far, it is understood that the interests of Mr. Barber and Col. Powers are merely contingent, while the active interests back of the Automatic Electric Company have taken their places in the Atlantic.

At a recent hearing before the Board of Apportionment on the Atlantic franchise, a number of independent telephone men were present and at a dinner given at the Waldorf-Astoria, the question of the independence of the Atlantic was discussed, and some very strong language indulged, in which the position taken by the Independents in Chicago was cited in evidence of the insincerity of the men behind the Atlantic Company, and the general feeling prevailed that some further evidence of absolute independence was necessary to warrant the Independent telephone men of the good faith of the Atlantic Company. The fact that Bell interests are at the present time operating "Independent Companies" in Newark, New Jersey, New Rochelle and Mt. Vernon, give rise to the fear that the activity of the Atlantic Company in prosecuting its franchise is another effort on the part of Bell interests to play "both ends against the middle."

Another condition that lends color to this prediction is the lack of franchise rights of the Bell interests to do a telephone business in New York. In Brooklyn, Queens, and Richmond, the old monopoly has absolutely no rights granted by the city, while in Manhattan and the Bronx it occupies the subways of the Empire City Subway Company, of which it owns 90 per cent of the stock, but which the City now proposes to take over under the provisions of the contract under which they were built. This will leave the \$100,000,000 of capital stock of the monopoly in Great New York without a franchise foundation, contending against the Great Eastern and its subsidiary companies with franchises extending to the use of its conduit system for electric lighting purposes, should it ever desire to exercise all of its franchise rights.

Facing such conditions, it is a matter of good business policy to secure a franchise for the Atlantic company



which could later be utilized by Bell interests to maintain their system in the metropolis, where they are now in much the same condition as they are in Chicago, where their franchise has expired. Engineer Nichols of the franchise department of the city, has advised the Board of Apportionment to grant an exclusive franchise to the monopoly under the same terms as offered by the Atlantic, but no one familiar with Bell methods would expect them to accept it, even if it could be legally granted, while Mayor George B. McClelland would hesitate to deny entrance to the metropolis of the 4,000,000 Independent telephone users who would gladly direct their commerce to this city as soon as the embargo can be raised.

While the scope of Independent competition throughout the country is but partially comprehended in the metropolis, even the purblind are able to see the drift of local conditions, which accounts in a very large degree for the failure to market the recent bonds authorized by the parent Bell Company for the benefit of extensions by its licensee companies. The first \$25,000,000 of bonds were practically taken by the syndicate a year before they were issued, in the payment of notes due in May, given in liquidation of the \$20,000,000 judgment secured about a year ago by the Western Union. The balance of the issue is held for a "more receptive money market," notwithstanding the pressing obligations to the Canadian Government and the distressed condition of many of its licensee companies.

Several of the leading dailies, such as the *World*, *Journal* and *Post*, have taken up the cause of the people and are demanding that the telephone monopoly be compelled to secure franchises or cease tearing up streets. More than a score of civic organizations have passed resolutions, the Board of Aldermen have had a hearing on telephone matters, and the monopoly managers find, too late, that their sins come home to roost. The \$100,000,000-capitalskyscraper has a sand foundation and no one knows it better than they do.

In the contest now waging between the Great Eastern and the combined forces of the monopoly, equipped with the machinery it has never hesitated to employ in cases of emergency, fighting for its last stronghold and seeing inevitable ruin in its overthrow, the strong men in the Independent field could greatly advance their own interests by lending moral support to those in the heat of the fray, which would not only redound to their own benefit, but would show the solid front to the enemy which won for us the Berliner contest.

The Mayor of New York City is a man in perfect accord with the advancement of the age, whose self-abnegation is buried in the advancement of the city which has honored him. Were he to realize the demand of the thousands of Independent telephone users seeking New

York City connection, or become aware of the arrogant traffic regulations of the monopoly excluding four million telephone users from the privilege of transacting business with this city, we would find in him our most worthy advocate in whose wise determination largely rests the proclamation emancipation which would strike the shackles from four million telephone users in the metropolis, who now pay tribute to the most arrogant and soulless task-master this country has ever known.

Attorneys of Mayfield and Paducah, Ky., acting for the Cumberland Telephone & Telegraph Co. (Bell), have filed suit to enjoin the Home Telephone Company from building a telephone exchange at Mayfield.

The Long Distance Independent Telephone Company of Boise, Idaho, has extended its toll line to Weiser, in that State, and now has an office there. Manager R. E. Hayes, of the company, says that as soon as possible a fully equipped exchange will be installed at Weiser. He also says that his company is about ready to enter the new building at Payette, where it will have 500 phones for its new switchboard.

The Independent Telephone Company of Topeka, Kans., is doing some very extensive underground work in that city. B. F. Pankey of the company, and George B. Roberts of Chicago, the company's chief engineer, have submitted complete plans for the work to the city engineer. Mr. Pankey says, "We will spend \$140,000 on underground work. The best of everything will be used."

Where a city sells for a term of years a franchise to a legally incorporated telephone company to erect and maintain a telephone system and do a telephone business in that city, paying therefor a certain stipulated sum yearly (or otherwise, inferentially), furnishing certain free service stipulated to the city (or, inferentially not furnishing such free service to the city, unless the franchise stipulated such service), the municipality cannot afterward, without the consent of the company, impose an additional charge upon the company. In other words, the city and the company having come to an agreement, and the company having fulfilled its duties under the agreement, the city may not thereafter impose additional taxation during the life of the franchise unless some unforeseen contingency should demand the use of the police power for the good of the community.—Cumberland Tel. & Tel. Co. vs. the City of Eminence, Ky., 90 S. W. 594.

## Notes of the Trade

### Baird's New Pay Station.

Exchange managers have for some time past realized that telephone pay-stations, as heretofore offered for sale, were not ideal in their construction or operation. The code of signals has not been satisfactory as operators have been constantly deceived as to the amount of the deposit.

A vitally important matter is that there has always been a question regarding whether the collector turns in the full amount of the collection. Other annoying features have been that repair men have access to the cash compartment and in

all types of machines heretofore offered for sale the mechanism has been difficult to get at. Cast iron cases heretofore used could easily be broken and robbed and it is practically impossible to fit a fine piece of mechanism into a cast iron case without tinkering.

For some time past Mr. Edward P. Baird, president of the Baird Manufacturing Company, 1507 Briar Place, Chicago, has been quietly at work inventing, developing and perfecting a new model pay station which overcomes all the faults in previous models and has many new features which are very attractive.

The above cut shows the Baird No. 143 Cash Register Pay-station which not only furnishes the operator with an unmistakable code of signals, but gives the subscriber and company an accurate check on the cash drawer and enables the collector to know the exact amount he should find there. The following is a detailed description of the features of the machine.

**Cash Register.**—Counts in multiples of nickles; one for 5c, two for 10c and five for 25c. This invaluable feature has been added without sacrificing simplicity. Aside from the counter itself there is not one single additional moving part in the machine, and the counter is absolutely positive and accurate in its adding up nickles, dimes and quarters.

**Common Sense Signals.**—But one very loud, clear bell tone is used for all signals as follows: One stroke of the bell and one flash of the supervisory signal for a nickel; two strokes of the bell and two flashes of the supervisory for a dime; three strokes and three flashes for a quarter. On magneto lines, instead of the flash of the supervisory lamp a click is heard immediately before each bell stroke. As the lamp flashes immediately before the bell is struck, a time element becomes a feature of the signals and they are practically impossible to beat.

This "Common Sense" code of signals requires no education of the operator as it does away with different musical tones and a different volume of sound. It harmonizes with signal codes now extensively used. (Patent has been applied for on this feature.)

**Powerful Lever.**—Owing to this mechanical action the great combination of features described is made possible. The old philosopher said, "give me a lever and a fulcrum and I will move the world." The powerful lever makes it possible to solve problems heretofore unsolved. A bold sign on top of the machine says, "Pull lever" and an arrow points directly at the crank handle.

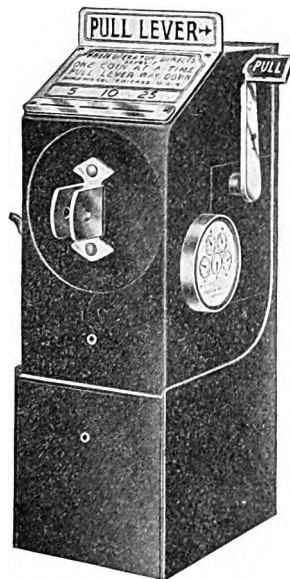
**Sheet Steel Case** formed in a punch press. Cannot be broken like cast iron.

**Separate Locked Compartments.**—The repair man is locked out of the cash drawer and the collector out of the mechanical compartment.

**Case Cover.**—Case cover to mechanism can be removed without disturbing the transmitter or any part of the machine.

**Rejector.**—Coins deposited in wrong slot by mistake are thrown out into a pocket at the left side of the case.

**Accessible Mechanism.**—Every working part is exposed to view when the cover is removed and the whole mechanism can be taken bodily from the case by removing four screws.



BAIRD NO. 143 CASH REGISTER PAY-STATION.

**Combination Lock.**—A combination lock is used on the cash compartment and is more secure than the average safe lock. Each one is set on a different combination.

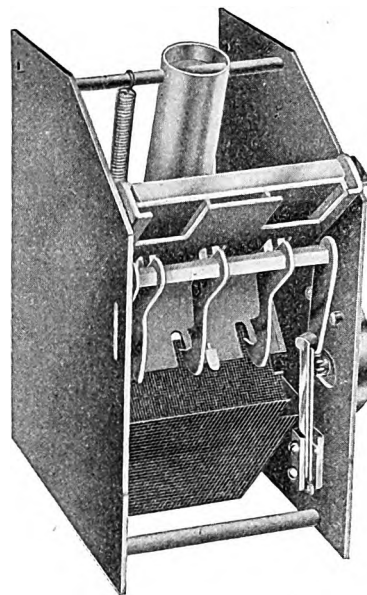
**Interchangeable Parts.**—The dies and tools for this beautiful piece of mechanism, which cost a small fortune, are as near perfection as any ever constructed and every part can be exactly duplicated in immense quantities.

**One Coin at a Time.**—In so-called "Automatic" pay stations several coins can be deposited so closely together that an operator cannot distinguish the signal and is often deceived.

In the No. 143 Baird machine but one can be deposited at a time, and the signal must be struck before another can follow.

**Noiseless Mechanism During Signal Period.**—In "Automatic" pay-stations the rattling of the coin down the channels helps to confuse the operator listening for the signal. Noises are made just as the signals are struck, but the new No. 143 signals are exceedingly loud and unmistakable, and are given after all noises made by the mechanism are over with.

**Reinforced Cash Compartments.**—Steel blades are attached to the sides of the cash compartment near the front and wings



INTERIOR MECHANISM OF NO. 143 PAY-STATION.

on the door fit behind them, thus preventing the prying open of the door, which fits into the case to a hair's breadth.

**Cost of Maintenance.**—The cost of maintenance of this machine will be very low owing to its simplicity of construction and remarkably few moving parts.

**Large Coin Capacity.**—The cash compartment is 5½ inches deep, ¾ inches high and 3½ inches wide, giving abundant coin capacity.

**Simple Mechanism.**—Despite the fact that this machine accomplishes so much more than any previous type its mechanism is simpler than in the popular No. 13 or No. 136 Baird Pay-station. The above cut shows the small number of moving parts.

While the No. 143 Pay-station, as illustrated, is intended for use on common battery telephones, yet the same machine can be supplied (No. 43) without the transmitter base on the front and with a mounting plate for attaching to any type of telephone.

The degree of perfection attained in this machine is the result of years of patient study, experiment and unexcelled facilities for the manufacture of high class mechanism.

### Another Electrical Show Planned.

The Electrical Trades Exposition Co., under whose auspices the great Electrical Show was held at Coliseum last January, and under whose good management the second annual Electrical Show will be held at the same place in Chicago, January 14-26, 1907, has issued a retrospective and prospective prospectus.

This company was incorporated in 1905, its personnel consisting of many leading men in all the various electrical lines. Its object is to enlarge and upbuild the electrical trade in all its branches, to maintain the position of Chicago as the electrical center of the United States, to provide a medium for the display of the new developments and advancements of the art, to familiarize the trade and the public with the countless appliances, apparatus and machines producing or utilizing electricity for the daily needs of mankind, to furnish publicity of the most valuable kind, and finally to bring the buyer direct to the seller, to their mutual profit.

The first show held at the Coliseum early in 1906 was pro-

nounced the greatest and best trade show ever held there, both in point of interest, attendance and educational value, as well as results to exhibitors. One hundred and twenty exhibitors, 30,000 square feet of space, 125,000 persons in attendance are figures on which this statement is based.

The second annual show promises still greater results, as the fame of the first show has been spread from coast to coast and stimulated the producers to even greater efforts.

It is expected that a large number of conventions will be held during the time this is in progress, among them being the North Western Elec. Ass'n., Electrical Salesmen Ass'n., National Interstate Telo. Ass'n., Illinois State Electrical Ass'n., Allied Electrical Trades Ass'n., and Sons of Jove.

There will be the usual special rates on all railroads, those obtained for the last show being one fare and one-third for the round trip.

Over seventy per cent of the space covered by the 1906 show has already been sold for the 1907 show, and it was necessary to take in addition to the Coliseum proper, the annex adjoining the main building, to be utilized for exhibits. This will be laid out in sizes suitable for large or small displays and a diagram showing the arrangements and dimensions of spaces will be sent on request.

The little prospectus also contains a number of comments from exhibitors of the 1906 Electrical Show with illustrations of many of the typical exhibits.

Mr. Homer Niesz is managing director of the Electrical Trades Exposition, with offices at 139 Adams St., Chicago. The other officers are: Samuel Insull, Pres., Ellsworth B. Overshiner, V. Pres., Charles E. Gregory, V. Pres., John Jay Abbott, Treas., Steward Spalding, Sec'y. Executive Committee; Ellsworth B. Overshiner, Chairman, Charles E. Gregory, Stewart Spalind. Directors: Samuel Insull, Charles E. Gregory, G. H. Atkin, Stewart Spalding, Ellsworth B. Overshiner, Geo. B. Foster, T. P. Gaylord, C. E. Mitchell, Homer E. Niesz, H. B. McMeal.

### Many Orders for Boards

The Dean Electric Company of Elyria, Ohio, has recently received orders for the following common battery switchboards:

Farmers' Mutual Independent Telephone Company, of Everett, Washington, one complete exchange equipment including multiple switchboard of 3000 lines ultimate, equipped for nine hundred sixty (960) local and thirty (30) rural lines, and to be provided with the Dean harmonic party line system. The contract also calls for one multiple toll section and complete power plant with a harmonic converter and telephones.

The Niagara County Home Telephone Company, Tonawanda, New York, one complete exchange equipment including a multiple switchboard of three thousand lines (3000 lines) ultimate, with eight hundred (800) local and thirty (30) rural lines equipped. This switchboard will be equipped for the Dean full selective party line system with duplicate harmonic converters and also telephones.

Seneca County Home Telephone Company, Seneca Falls, New York, for one complete exchange equipment including one thousand (1000) line Dean full multiple switchboard equipped with three hundred twenty (320) local and twenty (20) rural lines, and telephones.

The Clinton Telephone Company, Plattsburg, New York. The first exchange installed by The Dean Electric Company has placed an order for one hundred sixty (160) lines additional capacity and changing from multicycle ringing machines to the Dean harmonic converters.

The Inter-State Telephone Company, Little Falls, New York, to change a six hundred (600) line board to Dean harmonic selective four party system, changing all the key shelves, keys and plugs, and installing a harmonic converter.

The Shelby Telephone Company, Shelby, Ohio, for fifteen hundred (1500) line multiple switchboard, equipped for five hundred (500) local and sixty (60) magneto lines.

This switchboard is to be completely equipped for Dean harmonic selective party line system, with power plant and duplicate harmonic converters.

Covington Home Telephone Company, Covington, Ohio, has also placed an order for a four hundred fifty (450) line Dean Express type switchboard.

Besides the larger boards sold, contracts are being signed daily for one and two position switchboards of the different Dean types.

### The Western Telephone Manufacturing Co.

THE WESTERN TELEPHONE MFG. CO., of Chicago, is placing on the market a new line of telephones the construction of which shows a radical departure from customary methods of decorating telephones with useless, troublesome parts. Common sense construction according to correct mechanical and electrical ideas is shown in its new line of "Economist" and "Pioneer" telephones.

In the "Economist" telephone the cabinet is cut down to two-thirds the usual size and the opening of the door exposes all wiring and parts. Any part of this instrument can be easily removed by the use of a screw driver.

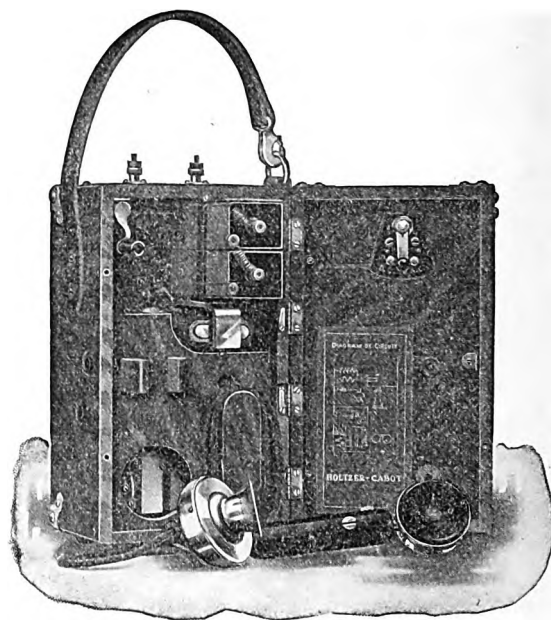
The "Pioneer" telephone is of the compact type, having the appearance of a central energy instrument. The wiring in the "Pioneer" telephone is so arranged that the loosening of three screws enables anyone to remove the shelf containing all working parts. Cabinet details of the above telephone include the new Western Shelf-centering lock, hinges with spring connection, and metal bushings in all corner screw holes.

The wiring in these instruments is so arranged that a condenser can be readily installed at any time with the aid of a screw driver. This company has discontinued the mounting of lightning arresters on telephone cabinets, the majority of lightning arresters on telephone instruments being inefficient and a source of trouble, and furnishes with each telephone its type "C" protector which is to be mounted separately.

This company will mail its bulletin No. 30 describing its full line of telephone apparatus to all parties requesting same.

### Lineman's Testing Set

The Holtzer-Cabot Electric Company, of Brookline, Mass., and Chicago, Ill., has brought out a new testing set known as the "Universal" type. This set has many novel features which should commend themselves to all users of this class of apparatus. It is made up of a hand microphone, standard generator, ringer, etc. The hand microphone is very solidly made and is equipped with a special metal mouthpiece instead of hard rubber, thereby insuring itself against any breakage in this respect. There is a push button in the handle of the hand



microphone which throws the batteries in circuit when talking at the will of the operator. This is a very desirable feature as it prevents the exhaustion of the battery when not actually in use for talking purposes. One source of trouble in the ordinary testing set is that the watch case receiver accidentally gets out of its place either while in service or while upon the shelf, and the result is that when the set is required in emergency it is found useless on account of the exhaustion of batteries.

The testing set is so constructed that the hand microphone can be taken out from its position for talking purposes and the door closed. The sets are regularly equipped with either three



## As To Telephone Batteries

There may be better batteries made in years to come—no doubt there will be—we are improving every year—but there is no battery more favorably known to telephone managers or subscribers to-day than the "1900" dry batteries they are now using.

It is called the "1900" because it is the embodiment of modern dry battery skill and experiment.

None so strong, none so enduring, and none that has stood so well the tests of experience.

Catalogue on request.

**The Nungesser Electric Battery Co.**

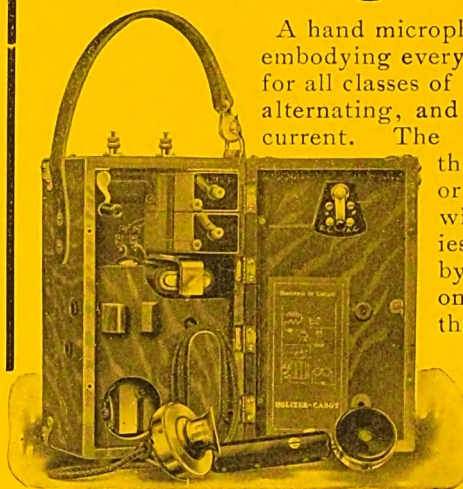
Ozias & Terry, Cleveland, O.

GENERAL SALES OFFICE,

128 W. Jackson Blvd. Chicago, Ill.



## Lineman's "Universal" Testing Set



A hand microphone testing set embodying every feature needed for all classes of testing. It has alternating, and also pulsating current. The ringer can be

thrown in circuit or shunted out at will. The batteries are controlled by a push button on the handle of the microphone, thus preventing their exhaustion. The door opens by a push button and is held

closed by an automatic catch—one hand can do the trick. The hand microphone obviates holding up a heavy box to talk into as in ordinary sets.

Truly a "Universal" set. Send for bulletin and price sheet 205

**The Holtzer-Gabot Electric Co.**  
395-97 Dearborn St., CHICAGO

FACTORY, BROOKLINE, MASS.



# Look for the RED SHIELD



It is the best guarantee of quality that a telephone or switch board can have. Specify the RED SHIELD when ordering Dry Battery, tape and soldering specialties if you want the best value for your money.

REMEMBER we are headquarters for cross arms, pins, barckets, insulators and construction materials and supplies of every description. We ship the same day order is received from Ft. Worth or St. Louis stock.

**WESCO SUPPLY CO.**

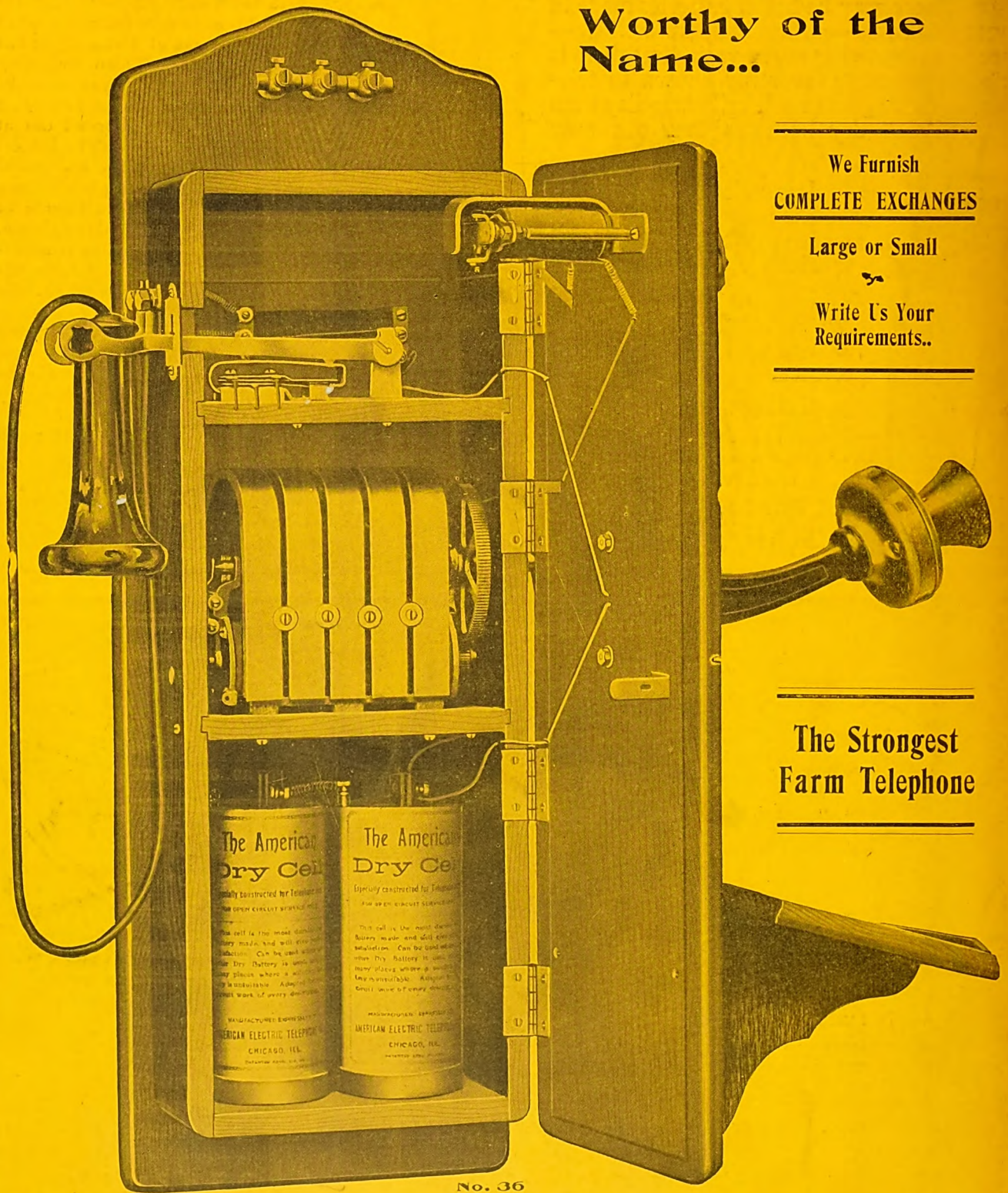
**ST. LOUIS, MO.**

**Branch Office and Warehouse, Ft. Worth, Texas**



# SAMSON BRIDGING

Worthy of the  
Name...



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We Furnish  
**COMPLETE EXCHANGES**

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Large or Small

Write Us Your  
Requirements..

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**The Strongest  
Farm Telephone**

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No. 36

**American Electric Telephone Company**  
State and 64th Streets, CHICAGO



# SOUND WAVES

VOL. XII  
No. 3

AN ADVOCATE OF  
INDEPENDENT TELEPHONY

AUGUST  
1906

Published Monthly by THE THOMAS H. WILSON CO., Logansport, Indiana

## STANDARD Underground Cable Co.

322 Rookery, Chicago

Pittsburgh  
Philadelphia  
Boston

New York  
St. Louis  
Oakland, Calif.,  
Bacon Blk.

## TELEPHONE CABLES

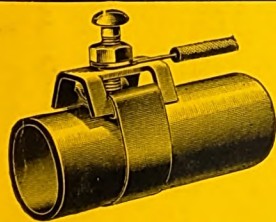
Hard Drawn Copper Wire, Bare  
and Weatherproof. Rub-  
ber Wires, All Styles

## PHENOLEUM AS A WOOD PRESERVATIVE

Leads all Preservatives in  
the Following Points:

- 1 Lowest Evaporation
- 2 Highest Percentage of Antiseptic Phenols
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- 4 Lowest Price

It may be Applied with a Brush to Cypress Poles, Giving them the Life of Cedar  
**DIELECTRIC MFG. CO.**  
Saint Louis



New  
York  
Ground  
Clamp

For connecting telephone ground wires to pipes and cables. Cheaper than a wrapped connection; as good as a soldered connection. Adopted by nearly all the Bell Tel. Co.'s and most of the larger Independent Tel. Co.'s. Samples free on application. Write for list of other specialties.

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YONKERS, N. Y., U. S. A.  
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H. C. Roberts Electric Supply Co., Phila., Pa.



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## POST HOLES

COST NOTHING BUT LABOR

The Iwan Post Hole Auger saves from  $\frac{1}{2}$  to  $\frac{3}{4}$  of the labor in making post holes.

Sizes 3, 4, 5, 6, 7, 8, 9, 10, 12 and 14 inch.

Sold by hardware dealers and construction supply companies.

Write for further particulars and prices. Mention Sound Waves.

MANUFACTURED ONLY BY

**IWAN BROS., STREATOR, ILL.**

## TELEPHONE CABLE

P  
A  
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**WATERBURY CO., 69 South St., N. Y.**

## JONES & WINTER

INDEPENDENT  
TELEPHONE ENGINEERS  
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Laboratory tests and extended practical experience have led such careful buyers as

The U. S. Government  
The Western Electric Co.  
The Western Union Telegraph Co.  
The Eastern Tel. & Tel. Co.

and thousands of others to

Prefer **S. P. F. Carbolineum**  
as the most reliable **Woodpreserver**

**BRUNO GROSCHKE & CO.**

LORDS' COURT BUILDING, NEW YORK

## DEARBORN TELEPHONES

Are first, last and all the time highest in quality, cheapest in price.

Made & Sold only by  
**DEARBORN ELECTRIC COMPANY**  
CHICAGO



Jobbers and Distributors of Telephone Supplies

## QUALITY FIRST!

GET SAMPLES AND PRICES

of



BEFORE BUYING

**RUBBER COVERED  
WIRE AND CABLES**

MANUFACTURED BY

**INDIANA RUBBER AND  
INSULATED WIRE CO.**

JONESBORO, IND.

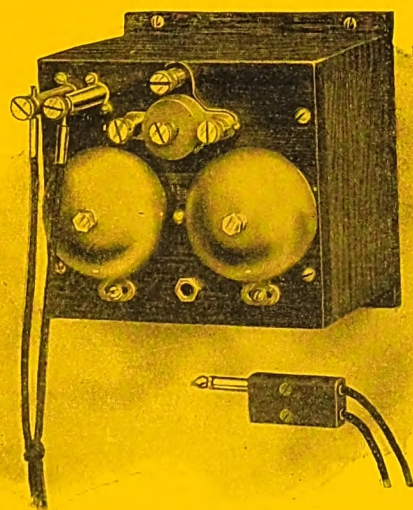
**QUALITY AND PRICE DECIDE**



# MONARCH



## Sectional Toll Line Switchboard



For small connecting stations where an operator is not always in attendance and where the expense of a regular switchboard would not be warranted, the Sectional Toll Line Switchboard as shown in the illustration is very desirable.

Each line entering the station is provided with one of the sections and a regular bridging telephone is used as an operator's set. The telephone is equipped with a cord and plug for cutting in on any line and for use in ringing out. The connecting cord with plug attached to each section is used for completing the connection between sections. The circuit

is so arranged that a clearing out signal is always on the line.

The ringers on the sections can be equipped with drop indicators if many sections are to be used. We recommend these sections for stations of from two to eight or ten lines. Our catalogue fully describes them and will be sent upon request.

# Monarch Telephone Mfg. Co.

CHICAGO, U.S.A.



# SOUND WAVES

A Monthly Magazine Devoted to the Interests of Independent Telephony

Vol. XII.

AUGUST, 1906

No. 3.

## SOUND WAVES

PUBLISHED MONTHLY AT LOGANSFORT, IND., U. S. A. PRICE FIFTY CENTS A YEAR  
COPYRIGHT, 1906.

Entered as second-class matter July 14, 1903, at the Post Office at  
Logansport, Indiana, under Act of Congress of March 3, 1879.

The Thos. H. Wilson Co., Logansport, Indiana, Proprietors and Publishers

W. A. TAYLOR, Technical Editor. . . . . 860 Monadnock Bldg., Chicago  
F. M. BAILEY, Manager, . . . . . 860 Monadnock Bldg., Chicago

Telephone, Logansport Office, Black 441

Telephone, Chicago Office, Harrison 1521, Chicago Telephone Co.  
Telephone, Chicago Office, 2904, Illinois Telephone Co. (Automatic)

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Single Copies, each . . . . . .10

S. RENTELL & CO., 39 Maiden Lane, Covent Garden, London, Eng., British Representatives

## NOTICE TO ADVERTISERS

**Changes of Copy** must be in this office not later than the 1st of each month.  
We can not insure changes of copy being made or advertisements being with-  
drawn after that date, as advertising forms begin going to press the 1st.

**New Advertisements** can be inserted if received by the 5th of each month  
but to insure proper classification they should be in this office by the 1st.

To mail the paper promptly, it is necessary for us to adhere strictly to the  
above, and we will appreciate the co-operation of advertisers.

**Subscriptions, Etc.**—Address the Logansport Office. In sending  
personal checks for books or subscriptions, include 15 cents for exchange.

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## EDITORIAL COMMENT

All communications to the advertising department of this paper should be sent to the Chicago office, addressed plainly to **SOUND WAVES**, 860 Monadnock Bldg., Chicago, Ill. All communications to editorial department, answers to want advertisements, subscriptions, etc., address **SOUND WAVES**, Logansport, Ind. Subscribers and others will confer a favor and facilitate the work of this paper by complying with the above request. Technical and news contributions will receive prompt attention and are respectfully solicited.

## RELATION OF THE ADVERTISER TO THE READERS.

The advertisements in trade and technical publications are read by many of the subscribers, but some pay little attention to them.

The advertisements are placed in our pages to catch the eyes of buyers of telephones, apparatus, books, etc.

All the new things, as well as articles whose merit has been proved by long experience, are thus shown from time to time, in the advertising pages. Their educational value is indisputable.

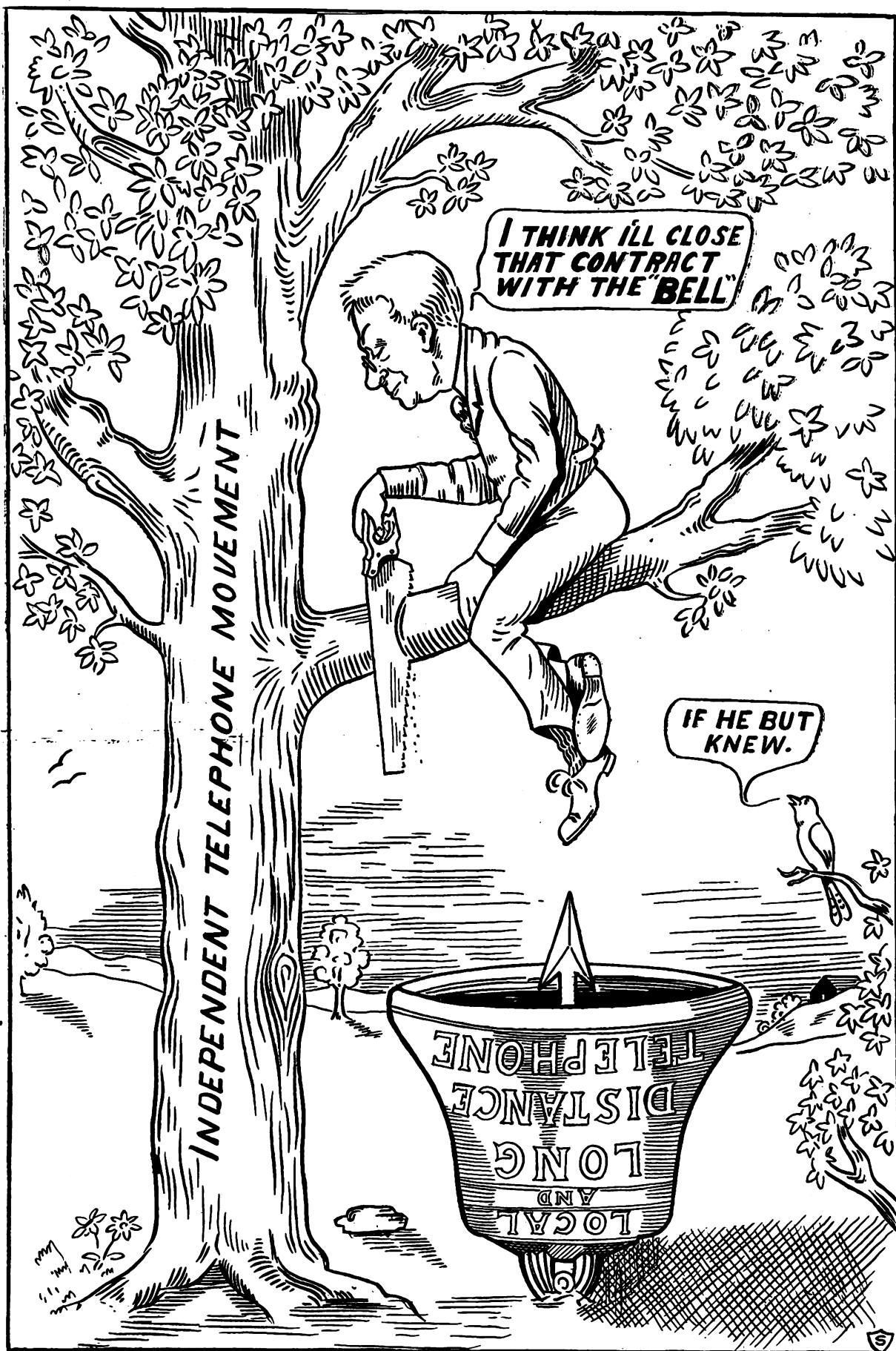
The advertiser is helping along the cause of telephony just as much as the person who writes educational articles, and if the reader does not study carefully the advertising pages he will miss a large share of the good that is brought to him by **SOUND WAVES**.

The advertiser shows you the really new things in the telephone field. If you do not understand a new instrument that is being introduced, or if you want to know something further about a certain product, write to the advertiser and ask him. That is just what he wishes. He wants to show you the merits of all that he is producing, and if you do not find out all that you wish, it is your own fault.

Those who advertise in this paper will give you all that they claim; if it were not so, we would not carry their advertisements. We wish you to patronize them all, with but one exception. If there is any doubt in your mind as to the exception referred to—write to us at once.

You must keep up-to-date or go under. Read all the news of new things on the market, for it is only by so doing that you can know what is out as soon as your competitor. It would be an ideal condition if each reader were to write to each advertiser regarding the commodity which he handles. Try it. You will receive the most





courteous and considerate treatment even though you do not purchase.

Some time ago a prominent manufacturer was asked why he read all of the advertisements in *SOUND WAVES* before he read any thing else. He replied, "Bless your heart, man, if I did not keep up to the time by reading what the other fellow is doing, I would soon be lost in the race. My engineers are the best in the land but they would be lost if they attempted to do it all. The experience of others is always a large factor in the progress of any individual."

Of course this manufacturer did not wish to buy any thing, but how much more do you as a buyer need to read carefully and investigate the merits of any thing that might help you.

An exchange engineer (he called himself that) once said that he never read any telephone periodical or book. You should have seen his exchange! His system went into the hands of the receiver. He is out of a job.

One of the prime reasons for advertising is to interest the prospective customer. If the customer is not interested he does not read the advertisement or the advertisement is not interesting. The former is probable, the latter is possible. If the reader is interested and does not make an inquiry, he loses a chance to increase his fund of knowledge.

The advertiser wants to sell to you, but he also wishes to have you write to him even though you do not anticipate purchasing at once. He has invited you to investigate and if he makes no sale he will at least have made a friend of you by treating you courteously.

### **MERIT REWARDED.**

To give honor where honor is due is a privilege which should be most highly prized. That due reward should follow meritorious service is undeniable.

These reflections must come home with peculiar force to those who attended the last meeting of the national convention. Without minimizing in the slightest degree the marked ability and distinguished service of the gentleman who was elected secretary of the association, there was some disappointment on the part of many of the delegates that Assistant Secretary John A. Harney would not permit his name to be considered by the convention for the secretaryship.

While Mr. Harney may, perhaps, be right in his stand that the secretary should be connected directly with the operating field, yet there are many who insist, with much force, that the important duties devolving upon the secretary can as well, if not better, be performed by some one not an operator and that Mr. Harney, in the light of his distinguished services during the past year, is the man who should have the place.

The evident admiration of every delegate for the services he has performed should be most gratifying to Mr. Harney, and on the other hand, his modesty and

good sense cannot fail to raise him still higher in the esteem of the members of the association. The proceedings of the convention during the last day gave Mr. Harney all the recognition that an election to the secretaryship would have accorded him.

While Iowa very properly supported her nominee, who was elected, it is gratifying to know that Iowa originated the motion which resulted in the reward of Mr. Harney by his retention as assistant secretary at a substantial increase in his salary.

The fidelity, interest and industry which Mr. Harney has shown as assistant secretary assure us that at some other time these services will be recognized by the honors of office along with its pecuniary rewards. The association will doubtless insist that Mr. Harney put aside his scruples and accept the full insignia of the secretary's office. During this year the association is doubly fortunate in having the services of two such efficient officers as Secretary Deering and Assistant Secretary Harney.

### **THE SOUND WAVES DAILY.**

The issuance of a daily paper is a novelty in telephone convention work, and while it perhaps shows—as our friends are kind enough to tell us—a commendable degree of enterprise, yet this is not the idea with which the *SOUND WAVES DAILY* was issued during the convention.

The International Independent Telephone Association is a body of such transcendent importance to the people of America; it has so grown in power and influence, and its purposes are so near the hearts and so wedded to the interests of all the people, that, during a convention such as the last one, nothing less than a daily paper will satisfy the requirements of the situation.

While we blushing acknowledge the boquets which our friends have thrown our way, yet we must insist that credit is due to the association alone, whose power and usefulness demand such added labors from the hands of its friends.

### **NEW NAME BETTER THAN OLD ONE.**

The International Telephone Association is a better name than the Interstate Telephone Association. The name of an association should be short enough for easy handling, yet should be definite as well. The new name adopted by the association admirably answers these requirements.

Credit for this timely change should be given to Edward R. Conklin, of Illinois, and doubtless in no less degree to the Hon. Francis Dagger, of Canada. We believe that Mr. Dagger mentioned the matter to Mr. Conklin before the convention met. Mr. Conklin was a member of the committee on the revision of the consti-

tution and by-laws. When the draft of the revision had been completed and submitted to the committee, it was Mr. Conklin who suggested the change of name to the International Telephone Association. The committee, and later, the convention, saw the force of the suggestion, and the new name was adopted.

Thus the association is broadened to admit Canada and even Mexico and South America, if necessary. Nor need it stop on this side of the water. While doubtless it will never be international in the sense of being worldwide, it can nevertheless perform its services to humanity here in a way which will show other peoples how to act in similar emergencies.

#### AVOID DANGEROUS COMPANY

The rattle snake in his proper element is a useful member of creation. Provided one lets him alone, he performs his functions and occupies his niche in the scheme of things, with entire satisfaction. But disturbed, handled, petted, he is dangerous. The bull snake



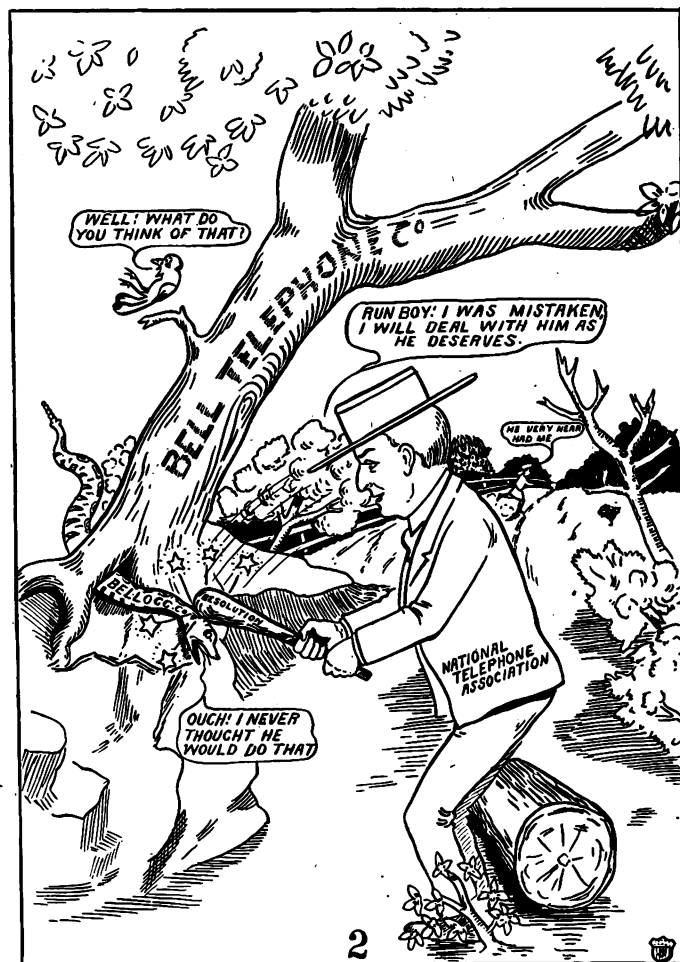
we used to know had the size and the swiftness and the appetite of the rattler. He performed the same function of keeping down the visible supply of young rabbits and gophers, and he didn't have the rattler's fangs. The bull snake was, therefore, regarded with affection and esteem—a sentiment which the rattler would have shared had it not been for his dangerous poison.

The first of the two allegorical cartoons presented was drawn before the International Association took any action against the Bell-owned Chicago manufacturing company. But in the meantime the association acted vigorously. This action is presented in allegory in the second cartoon.

The relation of the Bell-owned manufacturing company to the Independent field are matters of public concern.

It is vital to the public that Independent telephony shall prosper.

Dealing with the Bell-tainted company weakens your own position and strengthens that of the Bell. When



you have the Bell-tainted apparatus in they have you on the hip. If you start that way you have to keep it up or suffer a loss.

But if you start in with Independent apparatus you don't have to get up before a national convention and make explanations and apologies.

The presence of a Bell-owned manufacturing concern in the Independent field creates undue competition, weakening the hands of Independents.

The possession of Bell-made apparatus is a perpetual invitation to their sub-licensee agents.

Competition is the life of business; it is the spirit of progress, of development.

But it must be fair competition; it must be competition concentrated against a common enemy. No dividing interest should be admitted to the ranks. The

traitor and the spy are more dangerous than the avowed enemy on the firing line.

The Independent movement has force enough of itself to keep the balance more than even. In its hands is the development of the continent, telephonically.

There is no such thing as a natural monopoly. Monopoly is stagnation. Competition is development.

Let Independents brook no manufacturer in their ranks who is not Independent. The policy of the Bell is no quarter. Give them none. Disregard their products. Patronize no company owned by them. Hold no Bell associations.

There is no length to which the Bell will not go to secure control of the field. No dishonor is too deep, no stain too ineradicable, to prevent them from consummating their purposes. Nothing but fear of loss, or fear of the penitentiary, keeps the Bell interests from bolder and still bolder aggressions.

Let Independents remember that in the Bell there is neither fear no conscience nor reward. Over their doors is written, in the language of experience, as over the doors of the pit, "All hope abandon, ye who enter here."

### TREASON DEFINED.

The words "traitor" and "treason" as applied by Independents to other Independents who use goods made by a Bell-owned corporation, are susceptible of some definition.

The terms are not to be applied to those who originally equipped their exchanges with these goods, believing them to be Independent, and who are now compelled for obvious reasons to maintain the equipment; but the terms referred to are applicable to those who, knowing the goods to bear the Bell taint, make initial purchases for the sake of a fancied, but in the end, a costly economy.

It is well understood in the trade that the Bell-owned company in Chicago, which was formerly Independent, is making price concessions to hold its trade and gather in new customers. It is the cat's paw of the would-be trust, used indirectly to foment dissatisfaction among Independent operating companies and Independent manufacturers. In such a cause the Bell could well afford to stand a loss, if necessary.

If any Independent operators are not by this time on to the Bell's little game, they are too dense to be of much use in a wide-awake world.

### SOUND WAVES ENDORSED.

The signal endorsement by the International Association of the stand taken by SOUND WAVES with regard to a Chicago Bell-owned manufacturing company comes very gratefully indeed to this publication.

SOUND WAVES has repeatedly turned down the advertising of this company's apparatus, refusing in the face of threats and offers of money in advance to have anything to do with the goods manufactured by this company.

Our attitude in this matter, it must be evident, is right. No Independent who has read the scathing arraignment of the Bell-owned company in a recent issue of "Success" can doubt the rightness of our position and that of the Association in tying a tin can to the concern which, by devious ways, seeks to seduce Independents to their own ruin for the benefit of the Bell.

### ONE OF THE COMING MEN.

We note with considerable pleasure the promotion of enterprising young men who have energy and ability, but we have a peculiar satisfaction when the palm is merited, and is received by our personal friends.

Two years ago, Howard H. Bratt, who had already satisfactorily served the interests of several Bell telephone companies, prominent among which being the Chicago Telephone Company, accepted the position of superintendent of the Union Electric Telegraph & Telephone Company, with permanent headquarters at Rock Island, Illinois.

Mr. Bratt's efforts during the year 1904 proved so



satisfactory to the board of directors that he was requested to take the active management of the Davenport office, in addition to his other duties. How well he filled his position was evinced by his being promoted May 1, 1906, to the general superintendency of the company, with supervision of construction, operation and maintenance of all the company's plants, with head office at Davenport, Iowa.

Mr. Bratt has a thorough knowledge of the telephone business, having worked in all its branches, and although a comparatively young man has the full confidence of his employers. We are glad to welcome him to the ranks of Independent telephony.

We take this opportunity to congratulate Mr. Bratt upon his success in another direction, he having on May 16th last led to the altar Miss Muriel B. Miller, one of Davenport's most popular and attractive as well as accomplished young ladies, who will not refuse to reply to the name of Mrs. Bratt.

Readers of SOUND WAVES will be glad to know that at an early date there will be a continuation of the interesting "Man on the Road" sketches by Lloyd E. Knapp. Mr. Knapp, by the way, who wrote the previous sketch under that title, was one of the road men of the Century Telephone Construction Company. His work in that capacity was so efficient that he has been promoted to the position of manager of sales and advertising, with headquarters at the home office in Buffalo, N. Y., Mr. Bauer having taken charge of another department.



# International Independent Telephone Association

**Greatest Telephone Convention Ever Held; Tremendous Enthusiasm; Much Work Accomplished; Attendance Largest on Record.**

The International Independent Telephone Association has made history.

Its meeting, which was held June 27, 28 and 29 in Chicago, was one remarkable in so many respects that nothing less than the report of the proceedings will serve to enumerate all the features.

The old staff of executive officers, with the exception of the secretary were re-elected. That important post was given to Iowa, to a man whose indefatigable energy has been one of the important factors in the independent development of his state.

The name of the association, out of deference to Canada, and in view of a possible development in Mexico, was changed to the "International Independent Telephone Association."

Several important changes were made in the constitution and by-laws.

## FIRST SESSION OF THE ASSOCIATION.

The meeting was called to order between 2 and 3 o'clock Tuesday afternoon by the president James B. Hoge, of Cleveland. Mayor Dunne found it impossible to be present in person to welcome the delegates, but sent in his stead Corporation Counsel James Hamilton Lewis, who performed the duty assigned him in his usual witty and eloquent vein. After narrating several appropriate humorous stories having their basis in the unfamiliarity of some people with the process of telegraphic and telephonic transmission of intelligence, the speaker declared that the mayor had expressed great interest in the work of the Independent telephone men, having next his heart the interests of the people so constantly in conflict with monopolistic rapacity. Especially is he interested in independent telephony, because it



J. B. HOGE, PRESIDENT

The position of SOUND WAVES with regard to the Kellogg Switchboard & Supply Co. was inferentially endorsed in the following resolution:

*Whereas*, it is known that the Kellogg Switchboard and Supply Company of Chicago is owned by Bell officials,

*Therefore, Be It Resolved*, that this Association recommend that its members and all Independent telephone companies and individuals refrain from purchasing apparatus from them; *Provided*, that those now using the Kellogg equipment may continue to purchase additions and extensions without prejudice; and

*Be It Further Resolved*, that in the event of the Kellogg S. and S. Co. again passing into the control of independent people that this resolution be null and void and of no effect.

Reports from the various state associations indicate the enormous growth of the independent movement.

Reports of officers and delegates furnished proof of the strength of the national organization, which has, during the last year, been instrumental in organizing almost the entire United States in the fight against the I. T. I.



THEO. GARY, VICE-PRESIDENT

was in his administration that the city finally won its contention against the Chicago (Bell) Telephone Company and threw open the gates for independent competition. In conclusion Col. Lewis bade the delegates welcome on behalf of the mayor, the citizens and all public officers of Chicago.

E. H. Moulton of the Twin Cities Telephone Company, Minneapolis, responded to the welcoming address. He expressed surprise that Chicago should so long have refused the advantages which accrue to commerce by reason of many ways lead-system. He drew upon history for an illustration of the advantages which accrue to commerce by reason of many ways leading to and from a city, citing Venice in her palmy days of prosperity as a classical example. "Is Chicago to remain telephonically a city of one gate?" he asked. The speaker called attention to the fact that there are about twice as many independent telephones in use as there are Bell telephones. From

this condition he drew the conclusion that if the contention of the Bell Company that telephony is a natural monopoly is true, then it should be an independent monopoly, with the Bell out of the field entirely.

Following the above response President Hoge called Treas-



C. C. DEERING, SECRETARY

urer John G. Splane to the chair. Mr. Hoge then read his annual address, which was as follows:

#### THE PRESIDENT'S ADDRESS.

Gentlemen of the National Interstate Telephone Association—Since our last meeting so many things have happened that I hardly know which subject to make the most important. It has been my lot during the past year to do considerable writing on many of the most important subjects that have come up for consideration, and in treating with them for publication I quite naturally feel that you are in the same position as the little boy who stated to the minister that he knew more than the old men. When the minister took him to task about it he said, "I know lots of things dad don't know, and he has told me all he knows."

I have been telling you what I know on these subjects so long that I feel confident you know what I know, and that you have considerable information to impart here that I do not have. Custom, however, calls for an opening address from your president.

The constitution of this Association, Article II, reads: "The aim and purpose of this Association is to cement together in a firmer union all independent telephone interests in the United States, for the purpose of: First, gathering information and statistics; second, promotion of development in territory not now developed, and protection of existing interests; third, uniformity and standardization, and doing any and all other things that are to the best interests of the members of the Association."

Article III—"The Association shall maintain permanent headquarters, to be the office and center of the Association, to which all members of state and district associations in good standing with this Association shall have access, both in person and by mail."

The executive committee, at their meeting, before leaving Chicago last year, instructed me to open an office in the city of Cleveland, to employ an assistant secretary to take charge of same, and to pursue the objects of the Association so far as it was possible to do so. In order that the independent

interests of the country might be informed as to what was going on it was decided to issue monthly bulletins, which were published from month to month by practically all of the telephone journals and electric papers. We have gathered a large amount of data, which has been used by the independent companies in general, much of it used in a special way and to advantage by companies developing new territory, so I feel that everything done by your officials has been under your observation, and that you are all in touch in a general way at least with what the Association has been trying to accomplish.

In addition to the bulletins, the journals and magazines have published numerous articles written by officers of the Association and its friends, voicing the Association's sentiments:

#### OHIO PLAN NOW NATIONAL.

The past two years have been red letter years in our history. During that time the plan which was outlined as the "Ohio plan" at the St. Louis convention in 1904 has been adopted by twenty-two states, eight being organized during the past year. Therefore I feel safe in saying it has now become the "National plan," and justly so, as it is elastic enough to



J. A. HARNEY, ASS'T SECY.

meet any special condition that arises. The importance of organization and the benefits that we derive from an organization have been apparent to each and every one who has given the subject any special thought during this period. The benefits in having a compact organization that presents a solid front have been quite clearly illustrated by a prominent telephone man explaining how a lineman one day found himself unable to cut a heavy messenger wire with his pliers while it was bound together, so he opened it up, taking first one small strand, then another, cutting each with ease with his pliers as he pried it loose, until finally the entire messenger wire was cut. If we had not had our organization during the past two years it would have been very easy to have taken our companies one at a time and stampeded them, as during the two years it is estimated that our opponents have spent more money in misrepresenting our cause than they spent altogether in the five years previous. In addition to this, they have been giving away, or are practically giving away, service in many sections of the country. Yet with all this to contend with the independent

companies have forged ahead, extending their service, completing through connecting links, building a part of the few remaining cities, at the same time collecting for their service, and, where necessary, readjusting their rates, so as to meet the improved conditions with more extended service.

The securities of our companies are now regarded in an entirely different light from what they were two years ago, or even one year ago, and the investing public are analyzing them critically, finding them in most cases more conservatively financed and upon a more substantial basis than many of the securities that have heretofore been selling at much higher prices than our securities.

This brings us today to a much stronger position than we were in two years ago. We are working in harmony. The "Shield," that grand independent emblem which was adopted one year ago by this Association, and which, like the American flag, has led its followers on and on to victory after victory,



JOHN G. SPLANE, TREASURER

and never has been known to trail in defeat, is being used by many of the leading companies in forty-one states, and the public everywhere recognize it as being the trade mark of the telephone system which is responsible for increasing the total number of telephones in the United States from less than 300,000 eleven and one-half years ago to over 5,000,000 today, over 3,000,000 of which are connected with the independent system. They give us the credit of popularizing prices and extending the service. A great majority of the companies today are using the best material and the latest type of equipment to be had; operating rules and regulations, systems of accounting, and systems of advertising have all become more uniform, and yet, gentlemen, when you stop to consider the possibilities ahead of you in this great work you will see that you have more victories yet to win, many problems yet to solve.

It has been well said that no other public-serving utility, except the water companies, fill so important a place in the daily life of the American people as the telephone. A gentleman who has had much to do with public-serving corporations, but who has not been identified with telephone companies, said to me but a few days ago, "The telephone is by all odds the greatest necessity of public utilities."

Have we worked out the economics we should? Has it ever occurred to you that there are numerous points we have not yet covered? The electric railways have been spending thousands and hundreds of thousands of dollars in developing parks and resorts of all kinds in order to encourage business; the gas companies have been giving away stoves, hot plates, curling irons, gas fixtures and Welsbach mantels in order to encourage business, but the telephone companies have not had

to resort to these methods. They have in most cases found the business waiting. Are you handling it properly? Are you making each department self-supporting? Take notice how the railway companies do this. They charge each delegate here 25 cents to vise his ticket, which charge is to pay the expense of the agent certifying the ticket, so you can get reduced rates home. Before they will authorize a reduced rate, however, they compel the Association making the application to make a deposit of a sufficient amount to pay all the agent's expenses so that they play safe in any event.

#### PLEA FOR SQUARE DEAL.

Across the face of a Grecian temple was written these words: "Know thyself." I say, "Know thy business; know thy subscribers; know thy neighbors whose lines you connect with." In many cases the installation of the telephone has materially increased the value of real estate, reduced crime in both city and rural communities, brought all classes of society, denominations and political organizations closer together where they understood each other better and where they are afraid to take advantage of each other as they undertook to do previously to the time the telephone was placed in general operation. It has broken down the imaginary barriers between city and



CYRUS HULING, OHIO

country life and has completely annihilated distances. Are the city and rural companies, mutual companies, so-called, trying in all cases to follow the golden rule toward each other? An independent man has put it well by stating that some of the mutual "ownership fellows believe in rural ownership of municipalities."

The report of the special committee from the merchants and manufacturers of New York City, made public a few months ago, in the telephone situation in the United States is ridiculous to say the least, as it only shows, in the main, one-sided information. Why should the city officials in the few remaining cities where competition does not exist be so much afraid of granting franchises? Is it not possible that some one who has pecuniary motives is energetically engaged in trying to bring restraining influence to bear on them? In this age of prosperity, hustle and bustle, when the transportation companies, and, in fact, all the public-serving corporations, are nearly swamped trying to take care of the business offered, the public officials should endeavor to give their citizens every opportunity possible to have their requirements met in the best possible manner. Would any thriving community try to keep out any one of the great telegraph systems? Would they try to keep out any one of the great trunk line railway systems if an opportunity were offered to have their terminal properly established? Is it not a fact that some of our own people are very short-sighted in going after a franchise just because some one else is after it? For instance, I know of one city where no less than six companies are applying; some of these interests are said to be applying for the sole purpose of being bought out. Now, honor

bright, this is not fair. Get in line, boys, practice the golden rule. If some one else has arranged to build a plant in a city before you, either join forces with him on some fair basis, or get out and take up some other proposition.

We represent today an investment of over \$300,000,000, with over 3,000,000 telephones installed. We need not be ashamed



J. W. WEIK, INDIANA

to wear the "Shield," to fight for it and argue for it at any time. Let this coming year be one of education along organized lines. Let us help our neighbors as well as ourselves. The next ten years will see over 3,000,000 additional telephones connected with our system if we do our full duty. Strong interests are coming into the field each month. We are getting young men of wealth and influence interested, who are following their money into the business in a way that is a power for good. But a greater power for good is the fact that the masses are investing their money in these properties, and it is their property that is furnishing this service in their community, the same as it is their money that is furnishing the banking capital of their community, and they are going to lend their influence in seeing that the business is run on proper lines to give good service and fair returns upon the money invested.

#### STRONGER ORGANIZATION NEEDED.

What we need today is a better and stronger organization, provided with sufficient capital to prepare records of our system, to carry on a campaign of publicity and furnish to the press the information that they desire about the greatest industry ever developed in this country. During the past year this story has been partially written and published. The best magazines and journals of the country are deeply interested in the history and daily news of the enterprise which they have heretofore been given to understand was a myth and unworthy of mention. This was done through the misrepresentations of writers employed by the monopoly, who have felt it their duty to assume a self-constituted guardianship for the investing public and the telephone users of this country.

Why all of these arguments about some imaginary or even occasional failure? Suppose the banking journals and the press of the country would come out and say that all bankers were speculators, unsafe and dishonest scoundrels, because a gentleman high up in the business, in some particular state had gone wrong, or because a certain woman frenzied financier had been able to bust a country bank in Ohio and claiming that all banks are in the same condition, or that the banking business as a business was a failure. There is no doubt in any one's mind but what we have use

for more than twice the number of telephones that are installed in this country today. The question of rates is one that solves itself with competition, and it will not solve itself in any other way. Nothing is so good for business as live competition.

The public are dissatisfied today, about the Standard Oil trust, yet, gentlemen, I tell you their methods of carrying on their campaign have been manly, open and above-board as compared with the Bell trust which many of you know about. The great trouble has been to supply the service. It is going to be the trouble for some years to come.

A paper entitled "Telephone Publicity" has been arranged for and is on the program for tomorrow morning, which will especially develop this subject and I also wish to announce that the Illinois Association has made this matter a special feature to bring before this Association and are to be complimented. The data showing the growth of the telephone movement of this country furnished by our office in Cleveland to a certain local paper some months ago, was copied by a brokerage firm in New York City in their weekly market letter, copied from this letter by the Wall Street Journal and then copied from the Wall Street Journal by one of the leading dailies in Cleveland some three weeks after, as the basis of a Sunday editorial. I do not know how many more times it was published. The article pre-



W. B. WOODBURY, MICHIGAN

pared by our friend, Jesse W. Weik, and published in the Atlantic Monthly, was reviewed in the principal monthlies, and many of the dailies of the country. The same thing holds good with reference to Mr. Latzke's articles in Success Magazine. The public appreciate the fair treatment that our system has given them. A very striking illustration of this is the case in Seattle, Wash., where over 5,000 subscribers to the Bell telephone system in that city have ordered out their telephones on August 1st next, giving notice that on and after that date they expect to use the service of the Independent Company in that city exclusively. No business has shown itself to be safer and freer from heavy losses than the independent telephone business.

#### LET THE TRUTH BE KNOWN.

We do not furnish any data that cannot be substantiated by facts, but we should let the truth be known. This will never be known except through our organization. It must be prepared under well defined direction, and must not for many reasons be put out in a promiscuous way. An



old maxim is that the truth half told is the biggest lie ever told. Certain agents unfriendly to our interests are proposing through the press and by personal letters to be prepared to finance independent companies and to make independent securities a specialty, and in that way trying to get the most vital information that can be furnished them. These reports are rewritten in a way that will injure the company's cause and are put out where they think it will do the most harm. No information should be given out except in cases where the parties are known or vouched for



C. S. NORTON, INDIANA

by this Association. Their agents advertise for independent employes to take Bell positions at good wages, in that way getting in touch with employes from whom they can get any detrimental information concerning their exchanges by holding out false hopes for the purpose of using the data secured against those same companies. The lowest trick that I ever heard of is where a certain official of one of the large licensed companies advertised for Bell employes to take first-class independent positions for the sole purpose of seeing how many of his own employes would make applications, for the purpose of calling them in and reading the riot act about his opponents. Now all these things, gentlemen, are annoying, but they must be shortlived.

#### UNIFORMITY IN CHARGES.

The state of Wisconsin has passed a bill making it unlawful for a telephone company to charge more in one city than is charged by the companies in another city of the same class in the state. This law is getting good results, and I understand similar bills will be introduced in the legislatures of other states when they again convene. The United States government is investigating discriminations in rates of railway companies and trusts in general. Why not regulate our competitor?

In closing, I would be ungrateful if I did not acknowledge the honor you have bestowed upon me by my election at your last convention to the highest office of your organization. I desire to extend my thanks to you who have so nobly assisted in making our organization what it is today. This is not a one man's organization and I hope it never will be. It is an organization "of the people, by the people and for the people." Next year's success will depend very largely upon your thought and work here during the next two days. I have followed very closely the work done by

the district and state organizations throughout the country, and was much pleased a few days ago to receive in the mail a booklet that has been prepared by one of our newer state organizations in a state that a few years ago we looked upon as being inhabited mainly by Indians, and yet today they have 44,207 independent telephones and 177 switchboards, while their competitors have 13,711 telephones and 38 switchboards. The booklet is a credit to any association, and was published, gentlemen, by the Nebraska Independent Telephone Association. The district meetings in all states are in almost every case well attended. I find some of the best work is done at these meetings.

#### SEVEN INDISPUTABLE FACTS.

The Indiana Association at their recent meeting summed up the telephone in seven brief statements:

It is here to stay.

It has become a commercial and social necessity.

All classes recognize it as a fixed factor in human affairs.

Its mechanical and electrical construction is no longer an experiment.

No business of any consequence can be conducted successfully without it.

No home having social relations with the community in which it is established can ignore it.

It is being recognized by financiers as one of our most stable institutions for safe investment.

If the delegates and visitors attending this convention will devote the same energy that they devote to their business at home, during the next two days to those matters that need special attention and see to it that they are properly settled, your district and state meetings will be



T. H. POLLOCK, NEBRASKA

more successful. You all owe it to those who have honored you by sending you here to represent their interests, to give the deliberations of this Association your best thought and attention.

The exhibits are all well worth visiting. Look them over carefully, learn for yourself what is being developed, and then you will be able to make a report to your constituents that will well repay them for attending their next district or state meeting in order to get more completely in touch with what we did at the Chicago convention in 1906.

## STANDING COMMITTEES.

After the reading of his annual address, President Hoge announced the following committees:

**AMENDMENTS TO CONSTITUTION**—Cyrus Hul-  
ing, Ohio; Senator Klein, Pennsylvania; J. B. Ware, Michi-  
gan; J. B. Earle, Texas; A. B. Conklin, Illinois.

**WAYS AND MEANS**—J. G. Splane, Pennsylvania; R.  
B. McPherson, Michigan; Henry Barnhart, Indiana; J. S.  
Brailey, Ohio; Chas. E. Sumner, Oregon.

**NOMINATIONS**—E. D. Moulton, chairman; O. C.  
Snider, Missouri; M. B. Overly, Kentucky; W. Gilbert  
Thompson, Ohio; P. C. Holdoegel, Iowa.



A. C. LINDEMUTH, INDIANA

**PHOTOGRAPH COMMITTEE**—Geo. T. Hewes, Iowa,  
chairman; R. E. Mattison, Neb.; William L. Moellering,  
Indiana.

**CREDENTIALS**—C. E. Tarte, Michigan, chairman;  
Lewis Brucker, Ohio; A. C. Lindemuth, Indiana; Linton  
Reber, Maryland; Louis Blankenhorn, California.

**ENTERTAINMENT COMMITTEE**—C. W. Steiger,  
George Ihmsen, E. B. Overshiner, J. Y. Cracraft, W. H. Mc-  
Donough, W. W. Dean, C. D. Norton, H. B. McMeel, F. M.  
Bailey, C. Y. McVey, Geo. N. Bandy.

**COMMITTEE ON QUESTION BOX**—Theodore Gary,  
Macon, Mo.; Charles West, Allentown, Pa.; J. B. Rhodes,  
Zanesville, O.

## MR. HARNEY'S REPORT.

Assistant Secretary J. A. Harney read his annual report after the announcement of the committees. This proved to be one of the most valuable and instructive events of the entire session, and we take pleasure in presenting it here-with practically in full:

Chicago, Ill., June 26, 1906.

To the President, Executive Council, and Members of the National Interstate Telephone Association: The following is the report of your Assistant Secretary since the time of his appointment up to and including June 16, 1906:

In authorizing the establishment of a general office, the executive council did so with a view of making it permanent. This has always been kept in mind in carrying out the details of the work undertaken so that future development would not necessitate changes in methods adopted.

We found that one of the first things needed was an authentic record, so far as might be possible, of independent companies, and towns having independent service.

We accordingly commenced work on a complete self-indexing card record of such companies, with their exchanges

and toll-stations filed alphabetically according to towns, for each state in the union. This list was completed only the other day. The record contains all data obtainable, in connection with the company, including the population of towns and the names of counties in which they are located. According to this record there are 7,550 independent telephone companies operating in 12,125 cities and towns of the United States. We have found in checking up this list that a few companies supposed to be independent have Bell affiliations. Making due allowance for any such cases, which we may not have as yet discovered, a conservative estimate of the number of independent companies would not be less than 7,400, and cites and towns in which they operate, not less than 11,925.

This list is prepared for our own use exclusively and is not in such shape that it can be furnished for general use.

Other filing systems have been prepared for taking care of our correspondence and various data which we are collecting. All are self-indexing and sufficiently elastic to



R. E. MATTISON, NEBRASKA

take care of any possible growth. The monthly bulletins and special articles referred to in the president's address have been sent out promptly each month to all the journals. Copies of these, or marked copies of journals containing them, as well as other matter which appeared to be of national interest, have been sent out from time to time to the presidents and secretaries of the various state organizations. We have endeavored in this way to keep all of the independents through their state organizations thoroughly in touch with the general situation.

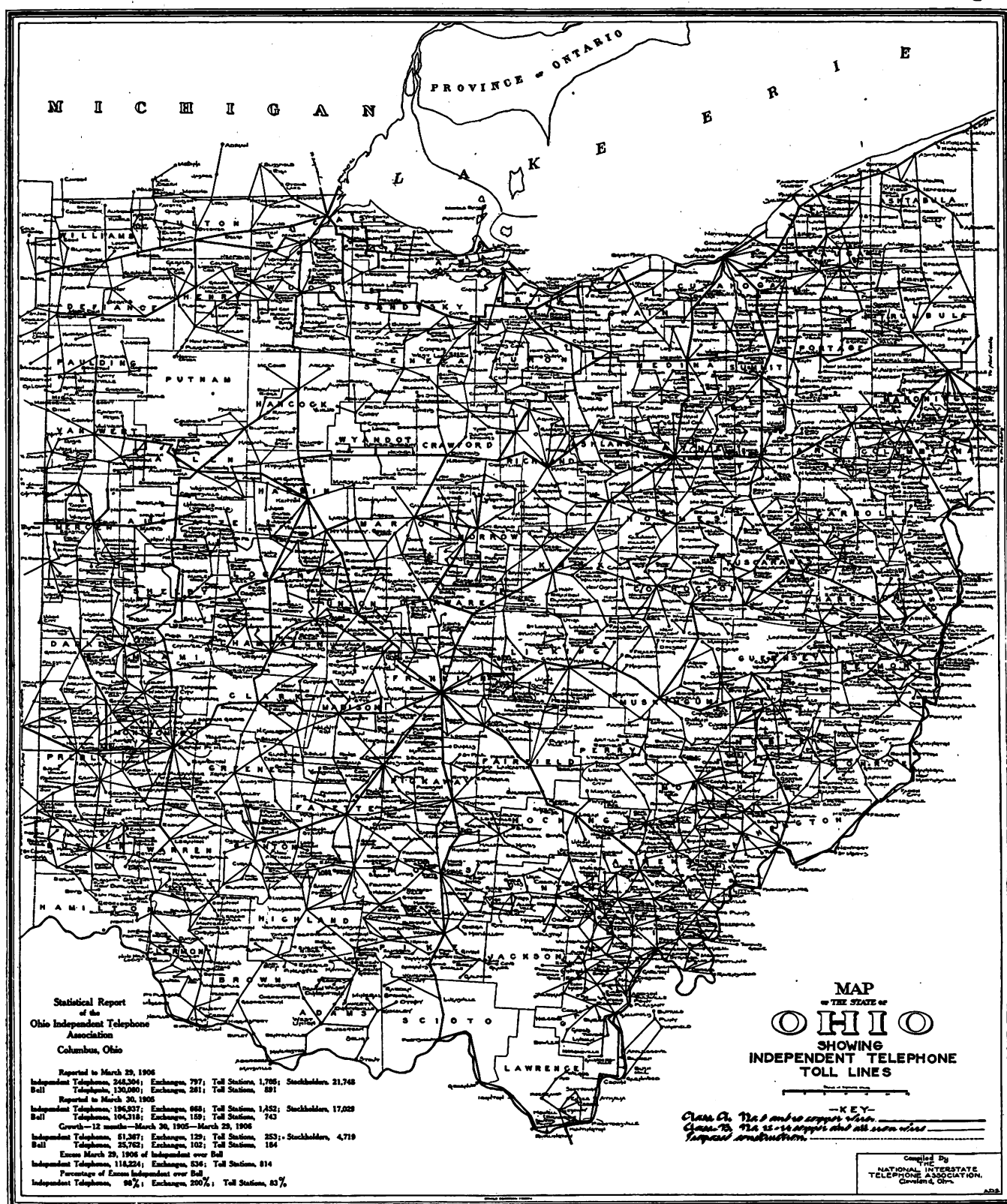
For handling the accounts a complete voucher check system, patterned after those in use by a number of the principal operating companies, has been accepted. This system makes possible a perfect and just distribution of the various items of expense under their proper headings, and at the same time assures a receipt in full for all money expended.

There is a handsome balance in the treasury and the supply department shows a fair profit.

Attached to this report is a list of contributors to the Association funds, with the amounts given by each. Also a list of states who have remitted in Assessment No. 1, with the amounts paid by each.

## SUPPLY DEPARTMENT.

The supply department, as explained through the journals, was established at the suggestion of independent telephone men from all parts of the country for the purpose of furnishing standard toll signs, printed matter and other



OHIO'S TELEPHONE MAP

supplies bearing the "Official Shield," to independent companies at the lowest possible cost with a view of thoroughly introducing the "Official Shield" adopted by the 1905 convention, making its use general throughout the country.

That the supply department has been the means of effectively accomplishing the principal object for which it was established is proven by the fact that the "Shield" is now being displayed in one form or another in forty-one states of the union, our records showing that independent companies in that number of states are securing supplies from this department. The states are as follows:



A. C. DAVIS, WEST VIRGINIA

Alabama, Arizona, California, District of Columbia, Florida, Georgia, Idaho, Illinois, Indiana, Indian Territory, Iowa, Kansas, Kentucky, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oregon, Oklahoma, Pennsylvania, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia, Wisconsin and Wyoming.

As previously stated, there are not less than 7,400 independent companies operating in 11,925 cities and towns of the United States. If all of these companies were to display the "Shield" on every possible occasion it is easy to see what an immense amount of advertising would be constantly given the independent movement.

If all of these companies were to patronize the supply department the revenue therefrom would go far towards maintaining the Association. Besides, the low prices at which the supplies could be furnished would result in a considerable saving for all of the companies taking advantage of this department.

These are features which should be given careful consideration by every independent telephone company.

To correct any wrong impression which might exist regarding the policy of the supply department, I am instructed to announce that the executive council in recommending its establishment did not intend to conflict with or enter the field already occupied by the various dealers in independent telephone apparatus and supplies, or make this department in any sense a general purchasing agency for independent companies. The object was to introduce, thoroughly advertise and constantly insist upon the use of the "Shield." It will be noticed that all of the supplies handled, with the exception of copy paper and second sheets, bear this emblem. We have a number of times been offered agencies for various articles manufactured for the use of

independent companies, but have invariably declined such offers, in accordance with the policy above outlined.

The action of the executive council in authorizing the establishment of the supply department is fully justified by the results obtained in extending the use of the "Shield."

#### MAP DEPARTMENT.

During the past few years there has been an increased demand among the independent people for authentic maps showing the development of their toll line systems in various sections of the country. Some of the state associations, and a number of the larger operating companies, have at various times prepared maps for their own use, but the establishment of the Association map department is the first effort that has been made to secure this data for the entire country.

After careful consideration it was decided to prepare maps by state, using for the purpose government post route maps furnished by the department of the interior. We found by experience that these maps were the most convenient and practical for our work. The data secured is spotted on the post-route maps and afterwards copied on tracings from which to make blue prints and plates. On the tracing only telephone lines, county and state boundaries, and important rivers and bodies of water are shown, thus making it a strictly telephone map. The lines are divided into two general classes. Copper lines of No. 10 and No. 8 gauge, or heavier, are designated as "Class A." Lines of No. 12 and No. 14 gauge copper and all iron wire are classified as "B" lines, leads containing both classes being counted as in "Class A." The object in making this division was that, generally speaking, copper lines No. 10 gauge, or heavier, can be used for long-haul business and might, therefore, be considered as trunk lines; while the lighter, copper and iron wire, being more generally used for shorter distances, might be considered as branch lines or feeders. It was not found practicable to show a greater number of classifications than two, but it is considered that the distinctions made are sufficient for all practical purposes in showing the development.



J. C. DUNCAN, TENNESSEE

At present the Association has on file post-route maps for forty-two states. One twenty-nine of these data has been spotted and tracings have been completed for seventeen.

The active work of collecting data by applying direct to the independent companies has been commenced on sixteen states. This includes Ohio, for which map has been completed and published in connection with the latest statistics,



and compiled by the Ohio Independent Telephone Association. Subscriptions for this map are now being received. It is planned to publish similar maps for the other states as rapidly as sufficient data can be secured.

Besides the state maps we have prepared a tracing of the principal toll lines in states north of Mason and Dixon's line, west from the Atlantic coast to Central Nebraska, showing the Interstate connections with a view of suggesting the possibilities of independent through lines across the country.

In preparing our maps absolutely no data are used that are not vouched for by independent companies, none of them being shown until all of the details are correct, so far as we can learn.

Mr. A. D. Schrader has been in charge of the map department since its establishment and has given very general satisfaction by the capable manner in which he has handled the work.



F. R. STRICKLER, INDIANA

To date we have received 920 separate maps representing the lines of about 1,000 independent companies. About 250 companies have advised that they operate no toll lines, making 1,120 companies out of a total of over 2,300 to whom requests for map data were sent. This is only 48 per cent. From one to four follow-up forms have been sent out to those who have still failed to respond and all of them have received stamps for reply. Of the maps received, an average of between two and three letters each have been necessary before obtaining results. Only a very small number of companies have sent in data unsolicited after reading our requests in the bulletins.

From this can be seen the immense amount of unnecessary work the Association is compelled to do in gathering the data for maps. If the independent people will only give this matter the attention it deserves, maps can be completed in about one-fourth the time and at less than 40 per cent of the present expense.

Tabulated statement giving detailed information for the various states mentioned is attached to this report.

#### PUBLICITY AND GENERAL STATISTICS.

For a short time last summer, as explained in the President's address, a news investigation department was conducted. We subscribed for the service of clipping bureaus in various parts of the country and investigated, in so far as possible, all articles directed against the independent interests. In practically every case the statements made were proven to be altogether false, or very misleading, the

assumption being that they were published at the instigation of, and probably paid for by the News Bureau of the only corporation interested in spreading such reports. Denials or explanations from independent companies were at various times published in the journals, and if necessary sent out in circular form to various parties.

The success of this department, brief as was its existence in running down the misleading statements of those interested in discrediting the independent movement, makes it exceedingly to be regretted that on account of insufficient funds it was not possible to continue this work.

Among other data gathered by the Association are lists of comparative telephone rates in the larger cities in which independent exchanges have been established. These lists show the rates charged and the number of phones in service when the independent companies commenced business with comparative figures up to the time such statements were issued for both the independent companies and their competitors.

We have also secured from important firms and prominent business men in various cities of the United States having both telephones, letters and telegrams indorsing competition in telephone service and explaining the benefits derived by the residents and business interests of such cities through the establishment of independent exchanges. Such data, in connection with figures showing the development in various states, and copies of maps, have been furnished on a number of occasions to assist independent interests in securing new franchises. A charge covering the cost of collecting and compiling such data is made for furnishing same, and in no case has it been given out to parties not known to the Association until they have been vouched for by well-known independent people, and the Association has been satisfied that the data furnished would not be used in any way to the detriment of the independent movement.



ORRIN F. FRENCH, OHIO

The Association is ready at all times to help independent interests in this way at a cost to cover the expense of furnishing the data requested.

This department, if properly developed and operated, in connection with the publicity department, would be a valuable feature of the organization and in time might be made practically self-supporting. In any event, the good it could accomplish for the independent movement as a whole would be incalculable—sufficient to warrant any expense necessary to properly maintain it.

With the exceptions stated, the matter of gathering statistics in connection with the various states has been

left to the state organizations, the plan being to have the Association tabulate and publish such data for the entire country. A number of the states have secured splendid statistics, but others do not appear to be giving this matter the attention it deserves. It is hoped that, during the coming year, all of the State Associations will assist us in gathering the most complete statistics possible relating to the independent movement in all parts of the country. The Association is prepared to promptly tabulate and publish all statistics furnished to the general office.

#### GENERAL.

The way in which the work in the general office has increased is typical of the Independent movement. When this office was opened it was estimated that the assistant secretary, with one stenographer, could take care of everything without inconvenience. It has been found necessary, however, to increase the help from time to time, until at present five stenographers are required to properly take care of the correspondence, and it has been necessary at times to secure extra help, while, with but few exceptions, all of the circular work has been handled outside. In spite of this it requires strenuous efforts on the part of all to keep up to date, and the time put in each day is usually in excess of what constitutes a day's work in the ordinary office.

As already explained, our members can do a great deal towards lessening the work in the general office by more promptly responding to requests for information and data sent out from time to time, and by encouraging their associates to do so.

On the whole, however, the independent interests of the country, both manufacturing and operating, have shown a most commendable disposition to co-operate with the Association in every way possible and have, on a number of occasions, given us their most hearty support in putting through special projects. We are indebted to individuals in various parts of the country for many valuable suggestions with reference to the methods of conducting the work, with a view of obtaining the best results. Through the officers of the state associations we have been able to bring to the notice of their members all important matters demanding their attention. The journals especially are entitled to your thanks for the many courtesies extended during the past year, in promptly publishing, often at considerable inconvenience, special matter furnished them from time to time.

At present we have a compact organization, capable, we believe, of indefinite extension, and are in a position to effectively prosecute all branches of the work undertaken. That the independent people appreciate our efforts and are prepared to co-operate with us is demonstrated by the many expressions of good will and the offers of assistance constantly received from every part of the country.

At present we are in close touch with all of the interests throughout the United States as never before. Taken as a whole, the past year has been very successful and there is every indication that the progress during the next twelve months will eclipse all previous records, provided that you, gentlemen, and your associates throughout the United States, appreciate the importance of co-operating with us at all times and rendering us the necessary assistance in advancing the cause of independent telephony.

#### WEDNESDAY MORNING'S SESSION.

The convention came to order at 10 o'clock. President Hoge appointed M. B. Overly temporary secretary during the session, owing to the fact that Asst. Secretary Harney would have to be absent from the room attending to other convention matters. The president announced that a mistake had been made in the

announcement of the name of one of the members of the committee on amendments to the constitution. E. R. Conklin was appointed, not A. B. Conklin.

The roll call of the states was taken up. Mack Hammett responded for Arkansas and Louis Blankenhorn for California.

Mr. Hammett said, among other things:

"The independent telephone companies are situated at the following places in Arkansas: Texarkana, Pine Bluff, Carlisle, Little Rock, Russellville, Adkins, Ozark, Altus, Fort Smith, Eureka Springs, Bald Knob, Walnut Ridge, Black Rock, Imoden, Horning, Paris, Rector, Pigott, and Elton with a total number of subscribers of 6,305. Texarkana heads the list with 1,600 subscribers; Little Rock is second with 1,000, and Fort Smith third, with 865 subscribers. The lowest is Imboden, with 60 subscribers. There are 2,675 subscribers that are neither Bell nor sublicense nor independent subscribers. Of this number at DeVitt in Arkansas county there are 250 subscribers. The Northern Arkansas Telephone Company, representing all of northwest Arkansas, including six exchanges, has 1,200 subscribers. The Reich Telephone Company, representing the north center, has 225 subscribers. The Keizer Telephone Company, representing southwest Arkansas, has 700 subscribers. Yellville and Carter have 175 subscribers, and Desarc has 125; making a total of Independent companies in the way of subscribers 8,980.

The sub-license companies have a total of 4,258 subscribers.

The total number of subscribers to the Bell exchange is found to be 11,885.

Mr. Louis Blankenhorn responded for California, said: "I represent southern California as an independent association. The independent companies are now reaching into the northern part of the state, to San Francisco and Oakland. Oakland is nearly built, and will be in operation in the course of six months, probably, in any event, starting with 5,600 subscribers. You know perhaps San Francisco has given the franchise to the Home Telephone Company, and they will start in there with 15,000 at least, but will probably exceed that in their initial installation.

The southern California business is represented by now close to thirty companies, representing, perhaps, ten millions of capital. The significant fact in connection with this is that the money has all been raised, and these companies have all been underwritten, promoted and floated in that remote section of the country, far away from you and scarcely known to you who live in the great East. Our companies there are all on a most substantial footing. We never have had any question of the superiority of the service and its popularity among the people. Everywhere it marks an excess of subscribers over those of the competing company. Southern California today has at least 43,000, and with the growth, can readily be said to have 45,000 subscribers as against a subscription of 10,000 less of the Bell companies.

#### MANUFACTURERS' SECTION PROPOSED.

On motion the order of business was suspended to admit a report from the committee on membership.

The chairman stated that several joint sessions of the manufacturers and the executive committee has been held to discuss the subject of admitting manufacturers to membership. Mr. Theodore Gary of Missouri then introduced the following resolution and moved its adoption:

"WHEREAS, a majority of the independent telephone manufacturers have petitioned the executive committee to provide a place for them in the Association with representation,

"THEREFORE, the executive committee, after holding several consultations with the manufacturers and consulting with the various members of the advisory board, decided to recom-

mend that a section be formed, to be known as the Manufacturers' Section of the Association, on the following terms and conditions:

- (1) The arrangement to continue for one year.
- (2) The Manufacturers' Section to contribute \$10,000 during the year commencing May 1.
- (3) The Manufacturers' Section to be entitled to one member on the advisory board.
- (4) The section to be entitled to twenty-five representatives as the Manufacturers' Section."

The resolution was discussed by Theo. Gary, B. F. Wasson and others, and was finally referred to the committee on amendments to the constitution for further action.

Mr. E. W. Steiger, chairman of the banquet committee, made a report describing the arrangements made to entertain the delegates at the White City.

#### ROLL CALL CONTINUED.

Following this announcement the roll call of states was continued.

Secretary Norton responded for Indiana. He said that there are 400 independent companies in that state, with 15,000 stockholders, 200,000 telephones, and \$20,000,000 worth of capital invested.

Mr. Holdoegel responded for Iowa. He said that they had organized the field successfully and that increase in independent telephones showed an advance of 10 per cent within a comparatively recent period. The state is now well covered with independent telephones, and before the end of the year independent toll lines will have been extended to every part of the state. Thirteen hundred companies reported for taxation; there are 200,000 or more telephones in the state, and the independent telephone property was assessed for \$160,000 more than the Western Union and Bell properties combined. The total assessed valuation of the independent telephone properties in the state is about \$2,500,000.

Mr. Miller made an interesting report from Kansas, saying that while he was but a year old in the telephone business he yielded nothing to any one in the matter of enthusiasm. He outlined the position of independent telephony in his state, and showed that the state is well supplied with independent companies, which are extending their lines to every part of the commonwealth.

Mr. Cole of Kentucky stated within comparatively recent time independent telephony had spread from one end of his state to the other, and that all the towns of from 1,000 to 1,500 people were supplied with the independent equipment. The long distance facilities have been developed in the most marked degree. He noted the interesting fact that wherever an independent exchange in started its subscribers soon outnumber those of the Bell companies in the same place. He said that the union of interests to secure long distance connections is one of the most effective means of securing the best results. The south is just waking up, he continued, and unless the people of the north infuse still greater energy into their independent campaign they will be reached and outstripped by the people of Dixie.

It was announced that Kentucky has just reorganized its Independent Telephone Association, and that it is now in excellent shape to take up the work in a thorough and systematic manner.

Some very interesting figures were given by Mr. Ware of Michigan. He said:

"Mr. President, Michigan has at the present time over 80,000 independent telephones. Six years ago at the time the Detroit company sold to the Bell and the Kalamazoo company also sold, some 10,000 telephones were taken out of our ranks, leaving less than 30,000, so that during the past six years we have redeemed the greater portion of the territory which we

lost. These telephones are owned largely by the few companies of the state. The Grand Rapids company, the Citizens Telephone Company, is the largest in the state, and has over 20,000 telephones at the present time. It last year had a net gain of about 3,800 in its territory, some eighty odd exchanges; thus far this year has had a net gain equal to almost that same number, so that this will be the banner year so far as growth is concerned.

The next largest company is that at Alma, the Union, with about 7,000 telephones. There is one at Saginaw with about 5,000.

Our companies are all in a good, healthy, prosperous condition. No place in the state has the Bell driven out an independent exchange. Few have been merged or purchased by the Bell Company during recent years, but the tendency of consolidation, the gradual consolidation, has prevailed, so that the companies have been diminished in numbers and increased in size, which has proved beneficial as we see it. In the entire state the Bell Telephone Company has perhaps more telephones. They claim, at least, more than have the independents. The excess is slight, if any. But in the lower peninsula outside of the city of Detroit, where there are some fifteen to eighteen thousand telephones, the independents have at least fifty per cent more telephones than have the Bell. In the city of Detroit a strong company has been organized and financed. Practically \$3,000,000 in cash is at its disposal, and on Monday of this week it began the laying of the conduits for a new exchange which will be absolutely modern in every particular, we believe the finest exchange in the United States, and with the securing of Detroit the probabilities are a repetition of the failure of the Bell Company of that city, which occurred, as you know two or three years ago. We are very much pleased with the fact that we have long distance circuits throughout the lower peninsula, and are connected by way of Toledo with the Ohio line. The outlook for our state is one of great satisfaction indeed."

W. B. Scruggs reported for Missouri. He said that only one part of the state has not been fully organized, and that portion is one in which the opportunities for independent development are very slight at the present time. The work will be taken up, however, in that section and pushed to successful completion in a short time. He complimented the work of Mr. Barnett especially. He said it was through his efforts that Missouri is now so well organized. The independents have 20,000 more telephones than the Bell in the state, and independent telephone companies have organized and are operating in nearly every town in Missouri.

R. E. Mattison responded for Nebraska. In that state there are 265 independent exchanges and 75,000 telephones, a development has been achieved largely during the past six years. The Bell company in Nebraska has only one-third as many telephones as the independents. The independents have about 45,000 miles of pole lines and organized a five-district state association this year. The shield has been generally adopted and all the independents are working harmoniously.

(Continued on Page 313)

I think the change of the name of the National Interstate Telephone Association to the International Independent Telephone Association is a very wise action on the part of the convention; that it will do more to encourage the efforts of the Independent companies in the Dominion of Canada than anything else, because it will give them the knowledge that there exists a practical sympathy with their movement, small though it may be at the present, on the part of the large Independent telephone operators in the United States.—HON. FRANCIS DAGGER.

# Telephone Competition and Monopoly

F. DAGGER

In addressing you today in response to the kind invitation of your energetic and indefatigable secretary, I am open to confess that my presence here is due to the conviction that I would gain more information upon the subject of independent telephony than I shall be able to impart to my hearers. To me it appears a somewhat novel proposition that a resident of Canada, where the independent telephone movement is as yet in its infancy, should be called to speak upon this all important subject to a body of men who are responsible for the establishment of a system comprising within your own State, more telephones than are yet in operation in the whole Dominion of Canada, including those under "Bell" control.

While, however, it has not been my good fortune to be associated with the great work so successfully carried on by the independent men of the United States, I have for the past seven years been engaged in a campaign for the improvement of telephone conditions in Canada; a campaign which has resulted in a government inquiry into telephone conditions, the adoption of legislation removing many of the disabilities under which the competing companies were labouring, and what is perhaps more important, the awakening of the people in every part of the Dominion to the knowledge that the full benefit of telephone service will never be realized so long as the "Bell" is allowed to remain in undisputed possession of the field.

It has further been my lot to be actively connected with the telephone business for the past 25 years, to have watched the development of the telephone service almost from its inception, and to have studied that development both under monopolistic and competitive conditions. I can therefore claim, I think, to speak with some degree of accuracy in regard to telephone matters generally.

My purpose today will be to place before you a few facts regarding telephone conditions in various parts of the world, and then to endeavor to show why the United States leads the way in the development of this service among the people.

## MONOPOLY NOT GIVING ADEQUATE SERVICE.

At the outset I may say that I know of no spot on the globe where monopoly, either government or corporation is giving an adequate telephone service; i. e., a service which enables the people to fully enjoy all the benefits which should be derived from this method of transmitting intelligence. Further than this, I have no knowledge of any fully developed competitive system which has ever failed to receive a larger patronage than that of a monopoly.

I shall as briefly as possible refer to the service existing in the principal countries of the world, where monopoly rules, leaving you to make the comparison with the conditions as you know them to be here after eleven years of competition.

I would ask you to note the very low rate of development in the countries to which I am about to refer, and to remember that according to the most reliable

figures to be obtained there is in the United States one telephone to every 20 inhabitants.

## CONDITIONS IN ENGLAND.

In Great Britain, with the exception of competitive municipal plants in five towns, the telephone service is a monopoly in the hands of the government and the National Telephone Company, the latter a corporation whose 25 years record is a very little better than that of the "Bell." On March 31st, 1905, the development of the British telephone service had only reached one telephone in 116 inhabitants. In London \$83 per annum is charged for unlimited service for the first telephone; subscribers having more than one direct line are charged \$69 a year for each additional line. For measured service \$25 plus 2 cents a call within the county and 4 cents outside the county but within the London area, is charged. Outside the city, two-party lines are furnished at \$15 plus 2 cents a call on the same exchange, and 4 cents to other points within the area. Outside the county ten-party lines are rented at \$10 plus 2 and 4 cents a call. The service in London is certainly very bad, the subscribers being unanimous in their condemnation of it. This is mainly due to the fact that the company when it had a monopoly incurred, by its methods, the opposition of the municipal authorities and have never been able to obtain proper right-of-way facilities, being compelled to use private property, instead of the streets. A few years ago the government established a system in London which was to compete with the company, but before the plant was in operation this policy was reversed and the two undertakings are now working as one system under two managements. The government system, being new, with underground conduits and common battery equipment, gives the best service, but in the absence of competition there is no incentive to reach that standard of excellence which is so conspicuous among the independent companies in the United States.

In the provincial towns of Great Britain the almost universal charge for service is \$49 a year for the first telephone and \$42 for each additional line. In small places the rates vary from \$39 to \$42 for the first telephone; and \$36 to \$42 each additional line. Where municipal competition exists measured rates are in force, ranging from \$25 a year for 1800 calls to \$44 for 5000 calls. For simplicity I am giving all these rates in even dollars, although they work out at slightly under values stated.

You will notice that while these rates may appear low for large towns, no provision is made in favor of the residential subscriber. Moreover, the small village and rural district is left entirely out of consideration. This is one of the main causes for the small development of the telephone industry in Great Britain. The equipment of the British telephone systems, with a few exceptions, are of the obsolete type and would be quickly converted into junk by the up-to-date independent manager over here. In short, the telephone monopoly in England has stifled every incentive towards improvement or extension of the service, with the result that telephone conditions today are very little better than they



were in the United States before the advent of the Independent movement.

#### SERVICE IN FRANCE INSUFFICIENT.

In France where the telephone is a state monopoly there is only one telephone to 500 inhabitants, Paris having 50 per cent of the subscribers in the whole country. The rate in Paris is \$80 a year, subscribers purchasing their own instruments and contributing towards the cost of installation, a rule which applies all over France. In Lyons the rate is \$59; in cities with more than 25,000 inhabitants \$39; and in smaller towns \$30. The service is very unsatisfactory, so much so, that in Paris an Association has been formed for the protection of telephone subscribers.

#### THE GERMAN SYSTEM.

In 1905 the German State telephone system averaged one telephone to 108 inhabitants, Berlin with 66,800 phones, having one to 28 inhabitants. The charges are based upon the number of subscribers, being as follows:

	Unlimited	Measured rate plus 1c a call.
50 Stations	\$19 a year	\$14 $\frac{1}{4}$
100 Stations	\$24 a year	\$14 $\frac{1}{4}$
200 Stations	\$29 a year	\$14 $\frac{1}{4}$
500 Stations	\$34 a year	\$14 $\frac{1}{4}$
1000 Stations	\$36 a year	\$18
5000 Stations	\$38 a year	\$21 $\frac{1}{2}$
20000 Stations	\$41 a year	\$21 $\frac{1}{2}$
Over 20,000	\$43 a year	\$24

Measured service users must pay for 400 calls a year whether made or otherwise.

Unlimited service is the most popular in Germany, it being adopted by nearly 62 per cent of the subscribers. In Berlin there are less than 13,000 measured service subscribers. The central equipments are of an antiquated type, while a large proportion of the lines are single grounded circuits. Continuous service is only given in the large cities, and the operating is slow and cumbersome.

In Bavaria there are 48,000 telephones, of which Munich and Nuremberg are responsible for 22,000, the average in those cities being one telephone to 35 inhabitants. The development of the whole country is one phone to 129 inhabitants. The rates are the same as in Germany. Three cities operate on the common battery system; otherwise the conditions resemble the German service.

#### AUSTRIA.

Austria, with a population of thirty-five millions, has less than 50,000 telephones, a development of one to 734 inhabitants. The proportion in Vienna is one to 130, the rate in that city being \$40 a year. In other parts of Austria the subscriber must pay an installation charge of \$20 for each 550 yards of line, and an annual rental of \$20.

#### BELGIUM.

The development of the Belgian state telephone system a year ago was one telephone to 293 inhabitants. For telephone purposes, the country is divided into seventeen groups or zones, the rates being fixed for unlimited service within each group. These vary from \$24 to \$49 a year according to the importance of the particular group. Continuous service is only given in nine groups. Three cities are installed with the common battery system, the other exchanges are magneto,

and there are still a large number of single grounded lines.

#### SWITZERLAND.

Switzerland has one telephone to 70 inhabitants. There is no unlimited rate. The measured service charges are; for the first year \$20, the second year \$14, thereafter \$8 per annum. Calls are one cent each. These rates appear low at first sight, but as 20 calls a day would with the lowest annual charge amount to \$68 a year, the subscriber who has much use for the telephone in Switzerland must find it pretty costly. Continuous service is only given in exchanges of over 300 stations. In the smaller systems a charge of from 5 to 10 cents is made for night calls. This is also a state owned service.

#### UNITED STATES AHEAD OF FOREIGN LANDS.

I think I have enumerated all the European countries where the telephone service is operated as a monopoly, and I would ask you to note the very low development of the telephone business in those countries in contrast with that in the United States at the present time. The average development of these seven countries is one telephone to 279 inhabitants, and I would here remind you that in 1894 the "Bell" companies had 238,000 subscribers stations, or an average of one telephone to about 300 of your population. Surely no stronger argument can be presented in support of telephone competition than these figures, which I would point out, with the exception of France, were supplied to the Canadian government under the signature of the head of the department administering the telephone service of each country. There can therefore be no question as to their accuracy. I could also refer you to the records of other countries, notably Australia, South Africa, Egypt and South America, in corroboration of the fact that development of the telephone business cannot be looked for under any system of monopoly, whether dominated by a government or corporation. I do not, however, wish to weary you with statistics.

In European countries where the long distance lines and larger exchanges are state owned, and the smaller systems are operated by local companies, there is a higher development. In Norway, where the state owns 27 exchanges with 16,000 subscribers, and local companies 173 exchanges and 21,000 telephones, there is one phone to 59 inhabitants. In Denmark where the systems are operated by local companies there is one telephone to 69 inhabitants. The increased development in these two countries is mainly due to the fact that small towns and villages are operated along almost the same lines as those followed by the independent companies in this country. The local companies look after the requirements of the rural districts in a manner which no government or great monopoly can ever hope to do. The results are therefore more favorable than in the other countries I have named.

#### TELEPHONE COMPETITION NECESSARY—STARTLING FIGURES.

I now turn to the subject of competition in telephones, and would first refer you to Stockholm, Sweden, where the International Bell Telephone Company established an exchange in 1880. Three years later a local independent company commenced operations and in twelve months had 2300 subscribers against 900 of the "Bell." The government subsequently deciding to monopolize the long distance lines, purchased all the "Bell" exchanges outside Stockholm, and established a system

in Stockholm to compete with the local "Bell" and independent companies. Conditions remained in this state for some years until the independent company acquired the "Bell" system and continued its competition with the State exchange.

On January 1st last year, the independent company had 31,685 telephones within the city limits or one to every ten inhabitants; and including the subscribers to the government system Stockholm now has one telephone to six inhabitants, which is, I believe, the most highly developed service in the world, though it must be remembered that competition has been in existence in that city 23 years; whereas in the United States the independent movement is not yet 12 years old.

Outside Stockholm and within a radius of 45 miles the independent company has 151 exchanges with 6000 subscribers. This extraordinary development is not yet showing any sign of diminishing, for I find that in 1904, the independent company gained 6003 new subscribers.

The Swedish state system had on Jan. 1st, 1905, 74,798 in the whole country inclusive of the Stockholm exchange.

In Great Britain competition by independent companies in every case resulted in a more rapid development of the service, and in the return of good dividends to the investor. Although these companies in consequence of the patent conditions existing at that date and the lack of long distance facilities, were induced to sell to the monopoly at very remunerative terms; the experience of this competition proved beyond doubt that the monopoly could not keep pace with the local companies, and that only the refusal of the government to permit independent companies to do business after the "Bell" patents expired, enable the monopoly to perpetuate the discreditable conditions which have existed in the British telephone industry until this day; conditions I may say, which only a movement similar to that of the independents here will remedy.

The result of competition by municipalities, which it must be admitted can never be as aggressive as that of Independent companies, proves conclusively that under monopoly there can be no proper development. Glasgow, after 21 years monopoly had in 1901 less than 7000 telephones; in 1905, after three years competition, 30,000. Portsmouth in 1902 had 1013 telephones; in 1905, after three years competition, 4,611. Brighton in 1903 had 1,100 telephones; in 1905, after two years competition 4,000; and I may add that if the splendid equipments, a specimen of which is to be found in the "Interstate" system in this city, and independent methods, had been adopted, these figures could have been doubled.

It is evident from these that the telephone is not, as "Bell" satellites would have us believe, a natural monopoly. On the contrary, it is impossible to find a community on any part of the globe, without competition, where the telephone is in such general use as to justify the service being termed a general utility. In fact, without competition the people do not become educated to its value as an indispensable adjunct in every department of business and home life. Ask the thousands of farmers using the telephone today what they knew of its value, and of the innumerable ways in which it assists them in their daily life, by saving labor, increasing their profits, and improving their social conditions before the independent movement carried the wire to their farms and connected them with their market town.

Coming to the question of telephone competition in the United States; in view of the marvelous progress

made by the independent movement in the last few years, it becomes a difficult task to add anything to the visible evidence to be found in every state of the Union. To have built up a business aggregating two and a half million telephones, representing an investment approximating \$250,000,000 within the past eleven years, is an achievement almost without parallel in the history of commerce and invention. No better guarantee then is necessary to demonstrate that the independent movement has come to stay and that the telephone service of the future will be dominated by the supporters of that movement.

As touching the financial aspect of competition, I may say that during the recent government telephone inquiry in Canada, evidence was obtained from all parts of the United States regarding the result of telephone competition, and statements were furnished by many independent companies regarding the physical and financial condition of various systems. After a careful analysis of these I am satisfied that it would not be possible to find among a similar number of any other class of industrial undertakings, more successful results.

Some time ago I saw a statement showing the dividends paid by 41 "Bell" companies in the United States, and in order to make a comparison I referred to the information furnished to the telephone committee, and compiled a statement of the dividends paid by the independent companies whose reports were furnished to the Canadian government. These reports from 49 companies representing sixteen states, showed an average dividend of 7.65 per cent, whereas the average of the 41 "Bell" companies was only 5.2 per cent. These figures undoubtedly indicate that independent telephone securities have reached a stage where they command the support and confidence of the investing public. More than that, I believe that in the face of present conditions, "Bell" securities must decrease in value, while those of the independents will attain a higher and more stable position in the money markets as the development continues to grow.

#### REASON FOR SUCCESS OF INDEPENDENTS IN UNITED STATES

It would appear to me that one reason for the success of the independent telephone movement is the fact that the "Bell" monopoly has by its greed and arrogance in the past forfeited the good will of the people. When it was in power it failed to recognize the principle that the accumulation of dollars is not the sole object for which a corporation is created. It overlooked the fact that it owed a duty to the people, in the performing of which it could alone hope to obtain and retain the confidence of the citizens of this great and liberty loving Union.

The permanent success of any nation or institution rests solely upon a policy of justice and honesty. Greed and arrogance have been responsible for the downfall of nations. The destruction of the Roman Empire, the decline of Spain as a world power, and more recently the humiliation of Russia in the east, can be traced to these causes. As with nations, so with individuals and institutions. Monopoly may pursue its course of extortion and arrogance for a time, but when the opportunity arrives, the popular verdict will hurl the aggressor from its pedestal. So the "Bell" has been "weighed in the balance and found wanting" by the citizens of the United States, enlightened as they have been by the policy of the Independents.

## CANADIANS AGAINST BELL METHODS.

In Canada also, from the Atlantic to the Pacific, there is hardly a municipality which having had any dealings with the monopoly or its allies, has not placed itself on record against "Bell" methods. Indeed, apart from its own stockholders, I assure you it would be very difficult to find its friends. The government of Manitoba has declared open war against the company and last session passed a bill for the establishment of a long distance system and locally controlled exchanges. The new provinces of Alberta and Saskatchewan are moving in the same direction in a determination to keep the North West out of the clutches of the monopoly. In the older provinces only the possession of the toll lines permits it to retain its hold on the local business, and if the expressed will of the people was carried into effect, the dominion government would acquire the "Bell" long distance system without delay.

In Ontario within the past three months an independent long distance company has been incorporated with a capital of \$2,500,000. Rural telephone systems are rapidly spreading all over the provinces, while a number of towns have either municipal or independent systems, including Fort William and Port Arthur, where the development reaches one telephone to ten inhabitants; also at Peterboro, Brantford, etc.

In Quebec, there are already a number of exchanges with about 2,000 miles of independent toll lines. Much work, however, remains to be done in Canada in the organization of the numerous small companies, the standardization of equipment, the linking together of the rural systems, and the opening up of the towns and cities. It is, however, only a matter of time when the whole North American continent will be gathered under the banner of the independents.

No movement in the world's history has a brighter outlook than the one in which you are engaged. It has passed through the stages of doubt and difficulty. It has survived the attacks of the monopoly and its creatures:

"The mighty wrongs and petty perfidy"  
 "The loud roar of foaming calumny"  
 "The small whisper of the, as paltry, few"  
 "And subtler venom of the reptile crew."

## CONCLUDING SUGGESTIONS.

It only remains with courage and confidence to carry on the work until every citizen throughout the land shall be supplied with this means of conversing with his fellowmen. I do not see why at the most conservative estimate the independent development should not reach 10 per cent of the entire population within the next few years. This will require an investment of approximately \$600,000,000 and of this you may be sure every dollar of this money will afford a far more remunerative investment than as if the same amount was put into railroads, electric lighting, or any other public utility.

Do not be pessimistic about the future. As you provide the facilities the people will reach out for them. It is not many years since wise men in the Dominion Parliament predicted that the receipts of the Canadian Pacific Railway would not pay for the axle grease. Today we find two more transcontinental railways hurrying forward construction in a race to connect the Atlantic with the Pacific. This is only one illustration of

how we may show timidity in estimating the possibilities of the future.

Above all, do not neglect your farmers. I firmly believe the decline of the "Bell" is almost entirely due to its refusal to furnish the rural districts with service. I am sure it will prove its downfall in Canada. On the contrary, I am satisfied that your success has been largely due to the development of the rural districts. It will always be so. I think it was Abraham Lincoln who said all your cities might be demolished tomorrow and new and more beautiful cities would rise above the ruins, but that if your farms were obliterated the grass would cover the streets of your cities for all time. Let your motto therefore be "a telephone in every farmhouse" and do not rest until this is the practical outcome of your labors. You have already proved what can be done in Illinois. I have had the privilege as the guest of your president of driving over many of your farm lines, and also of inspecting the splendid toll lines of the Inter-State Company, and I can say that no better equipment has come under my notice. I have also inspected several of the Inter-State Company's exchanges. I have noted the splendid equipment, than which there is none better on this continent. I have tested the service which is unsurpassed in the United States. I hear nothing but praise of the service and management in all directions. I congratulate you on your president and the able manner in which he has upheld the banner of the independents in your state. Let the good work go on. Be united. Do not let petty differences weaken your efforts. Present at all times an unbroken front to your opponents. Let your aim be to give your subscribers the best equipment, the most perfect service, the most courteous treatment and no combination of circumstances can keep back the ever increasing tide of your success.

[The foregoing paper was read by Hon. Francis Dagger, telephone expert, to the Dominion House of Commons Select Committee on Telephone Systems, Ottawa, Canada, before the first annual convention of the Illinois Telephone Association, Peoria, Ill., June 20, 1906.]

The Bell injunction tactics are about the same everywhere. One of the most recent outbreaks was by the Pacific States Telephone & Telegraph Company against the Home Telephone Company of Albany, Ore., seeking to enjoin the latter company from constructing an independent system at that place. In a published statement the Home Company assured its patrons that it stood upon solid legal grounds and that nothing was to be feared from the injunction sought, an opinion which was later on borne out by the decision of the court. The case was similar to one tried at Salem, Ore., where the Home Telephone Company won, defeating the injunction suit. In the Albany case, which came up a short time ago, the court dismissed the Bell Company's bill for want of equity, saying that the Bell Company had no exclusive franchise in the city and that the Home Company is not, as charged, doing business without legal warrant.

The Girard Mutual Telephone Company of Girard, Kansas, furnishes telephones for business houses at \$1.00 and for residence 50 cents. This company was incorporated last winter and uses Magneto switchboards. A. M. Smith is president, E. E. Beadle secretary, and T. B. Davidson is manager. The company has no branch exchanges, but are installing some at McCune, Pittsburg and Columbus.

# Texas

J. B. EARLE

Texas is an empire in itself, too big to be properly handled in so limited a time, even from a telephone standpoint. It is 938 miles west from Orange to El Paso; it is 587 miles from Laredo north to Texarkana. The traveller from Texarkana makes a shorter journey to Chicago than to Texline on the eastern boundary of New Mexico. With an area of 265,780 square miles, embracing lands of all descriptions, one can readily understand it is not a difficult matter to find abundant opportunities for development in almost any enterprise. If Texas was as densely populated as Illinois it would have 14,500,000 people. If as densely populated as New York it would have a population of 28,000,000, or as New Jersey, 64,000,000.

As it is it has only a little more than 3,000,000; in our largest county, Dallas, we have 92 persons to the square mile, while in Castro county we have only one person to 100 square miles.

The tax valuations amount to over \$946,000,000, which, divided into population would give an average value of \$314.00 to each man, woman and child in the state.

Our pine forests furnish lumber to Canada and the Panama canal zone. We compete with Cuba for the highest quality of tobacco. You can to-day buy our peaches on the streets of Chicago, and our fruit lands developed would supply the United States. We are to-day producing a great proportion of the world's output of oil; the mineral resources are fast coming into prominence with the highest percentage grade of iron ore in the world; fortunes are being made in raising rice.

Most of you have doubtless heard of us as cattle raisers and of the vast ranches, but these must be seen to be appreciated. The telephone constructor will learn no ranchman is so poor as to deny himself the conveniences and quick methods of doing business. I have simply mentioned these things without speaking of the "black land belt," or the heart of the state. This is a strip of land about four or five counties of seventy-five to one hundred miles wide extending from the Gulf of Mexico up through Central Texas and to and through the Indian Territory, and in it you have thousands of square miles of the richest land in the world on which we grow our great crops of corn, wheat, oats and cotton, the greater or less success of the Texas crop of the last fixing in a large measure the price for the world. Each of these products we raise in such quantities as would almost cause you to doubt the government statistics. Our climate is such that we carry on our out-door work the year round. True we are charged with hot weather at this season of the year, but our men work straight along and sun strokes are almost unknown. We are blessed with the most genial winters and are plucking roses from our yards for Christmas, while you are caring for sleet-burdened lines in the north and west.

We endeavor to pay our employees a fair wage scale, and while it is less than you pay, it is more to them on account of much reduced cost of living.

We have no labor troubles, first, because we pay fair wages, and second, we treat our employees fairly and promote on merit only, working the open shop and giving preference to the men who deserve it. The Bell Com-

pany with us do not employ union men when they know it, except in cases of emergency.

Considering our soil, climatic conditions and labor, we offset our higher freight rate so the cost of telephone construction is about the same as with you, while maintenance, of course, is much less.

The time was when Texas had the reputation of passing most drastic laws unfair to foreign capital and especially to corporations. This was more in the reputation than the actual character of the laws, more a theory than a fact, and I believe to-day, taken as a whole, our laws are as favorable to telephone and telegraph companies as are the laws of any state in the union.

True we do pay 1½ per cent. of gross receipts as a gross receipt tax but in return we are given privileges not enjoyed by our friends from some other states. Art. 698 of the Revised Statutes of Texas gives "corporations created for the purpose of constructing and maintaining magnetic telegraph lines (and our Supreme Court construes a telephone line to be a telegraph line) authority to set their poles, piers, abutments, wires and other fixtures along, upon and across any of the public roads, streets and water of this state in such a manner as not to incommode the public in the use of the roads, streets and waters," and says further "that such companies are also authorized to enter upon any lands, whether owned by private persons in fee or in any less estate, or by any corporation whether acquired by purchase or by virtue of any provision in the charter of such corporation, for the purpose of making preliminary surveys and examinations with a view to the erection of any telegraph lines and from time to time to appropriate so much of said lands as may be necessary to erect such poles, abutments, wires and other necessary fixtures for magnetic telegraph lines and to make such changes of location of part of said lines as may from time to time be deemed necessary and shall have a right of access to construct said line and when erected, from time to time may be required to repair the same, and may proceed to obtain the right of way and to condemn lands for the use of the corporation in the manner provided by law in the case of railway corporations." "No corporation shall have the power to contract with the owner of land for the right to erect and maintain a telegraph line over its lands to the exclusion of the lines of other companies." Our statute also provides for the joining and consolidation of telegraph or telephone companies.

As a result of these laws almost all our trunk toll lines are built on the right of way of the railways, the same as the Western Union Telegraph Company is in your territory. In condemning the right of way of a railroad company we select three men who, after sitting as a commission to fix values, usually find from three to five dollars per mile damages for the railway company, and you can at once proceed with your construction work, even in case of an appeal from the decision of the commission. In one suit you can condemn the right of way of a whole system, and not have to proceed against them in each separate county. The advantages in this are apparent; we distribute our poles, cross-arms, wire, etc., from a slow train paying only regular local freight rate for material and regular passenger rates for the men



necessary to unload the poles, etc. During the entire time of construction the facilities for getting the men to and from work is of no small advantage. No right of way to be cleared or trees trimmed and no corners to hold, while the distance from one town to another is always the shortest possible route. These advantages do not stop with construction but are equally important in the matter of maintenance. In case of toll line trouble we send a man in our district to the nearest station with his railroad velocipede and as soon as he clears the trouble he comes in easily at from ten to twelve miles an hour. If the trouble tests within a reasonable distance he goes and comes on his car.

With our land values increasing so rapidly and paying such interest in rents to landlords, producing such profitable crops for tenants, with resources without number as we so often find in newly settled countries, our people are so much absorbed in those things with which they are familiar, they have little idle money to put in stocks, while six per cent. bonds do not appeal to them. Vendor lien notes on black land farms bear more interest than this and as safe an investment as government bonds.

In Texas the customary rate for telephone rentals in exchanges of more than four to five hundred telephones is twenty-four dollars for residence and thirty-six dollars for business telephones per annum, while in the smaller exchanges the rate is eighteen dollars for residence and thirty dollars per annum for business 'phones. In each case the rural party line telephone takes the exchange residence rate, with from six to ten on a line.

These we believe to be fair and just rates inasmuch as our long distance and special wire leases are where we look most for profit. The adopted rate by Bell and Independent companies for long distance telephoning is one cent per mile for five minutes, sixty per cent, of this for the minimum of two minutes, seventy-three per cent. for three minutes and eighty-six per cent. for four and one-fifth of the five-minute rate, for each additional minute, and one-half of this rate for night rate. Some of our companies have adopted the Bell minimum rate of twenty-five cents but in Central Texas we allow a minimum rate of fifteen cents for two minutes on calls less than twenty miles.

Some of you will be surprised to know that the Bell's best long distance station west of Chicago is Dallas, Texas, where the average is, I am informed, about fifteen dollars per telephone per annum.

People in our state have the telephone habit and on account of our methods of handling especially the grain and cotton crops, the long distance business is probably greater than any other section of the world on a basis of population. Our cotton harvest begins about the first of August or almost as soon as the last of the grain is marketed, and lasts from six to eight months. The price of cotton is talked every minute of every day during the season. The farmer rings his exchange merchants, who in turn get the three markets, Liverpool, New York and New Orleans, not less than three times a day and at times of many fluctuations leaves notice with his cotton exchange to ring him on each variation of five points. Some merchants make arrangements to have us keep them posted and pay for the market twenty-five dollars per month; this is given at a distance of not more than forty miles.

It is the medium cotton buyer who has a toll bill of from one to three dollars per month, while I know of factors whose wire rent and tolls in Texas alone amount

to more than a thousand dollars a month during the cotton season.

In addition to our toll service we have some lines composited and receive for the telegraph privilege about eighteen to twenty dollars per mile per annum. This is in no way interfering with the telephone service. In this last matter the Independent companies are much handicapped, as all these lines are for great distances, 200 to 500 miles and altogether for cotton business. The price of a message is never thought of when selling even one bale of cotton, as a few points more than cover the toll charge. A bale of cotton is the same as money to us, yet the amount of money is a question, when it has been known to vary more than five dollars per bale in one day, you can readily see the man holding from 100 to 1,000 bales buying and selling all day wants the market each minute. They all, in addition to having their telephones with the exchange, run specials direct to the long distance board on what we term "toll loops," and in many instances a special direct to the local cotton exchange. In many instances a cotton factor will have printed a list of from twenty to fifty of his agents in the field simply giving each a number and when he wants them he gives his code of numbers, frequently twenty at a call. Again, our people have never learned to economize and too frequently the telephone is used where a letter would have as well served the purpose. At fifty dollars per bale with Texas producing 3,000,000 bales, or twenty-three per cent. of the world's output, and each bale handled several times over the wires one can readily understand how the Bell Company in Texas can show in its tax report a gross receipt account of \$2,381,699.57 for telephone receipts and \$50,483.78 from six months' special wire rentals, and in a measure it shows the need of the many circuits they have through the black land belt, as shown by their map which I have here. What this would amount to if they or the Independents had the state thoroughly covered one can hardly foretell.

The Southwestern or Bell is developing as rapidly as possible and the local Independents are doing well, but both together cannot take care of business. In no place do I believe there is a stronger sentiment or a stronger spirit in favor of developing the resources of a state. To this is added an opposition to all monopolies that runs through almost every individual in all classes of society. Texas offers no inducement for the telephone man who is strictly a promoter; and it is not a good field in which a man can invest his money and leave it to take care of itself. But to the men or set of men who will come to Texas and become associates with our people and secure the advantage of the personal element from association and friendship, I believe no field offers a greater opportunity for telephone investments either in exchanges or toll lines.

Independent telephone exchanges have been built in most of the large cities of the state and are prosperous where they have been properly constructed, good service is given and the property well maintained. You can readily understand from what I have said that the one thing our telephone users demand is the best of service. The man who took time to go across the street for a drink and while he was gone lost fifteen hundred dollars on a cotton transaction has no use for telephone service where it takes him half an hour to get the toll operator. Trunk toll lines have been constructed through most of the black land district, but not nearly all of the valuable territory in this portion of the state is yet developed.

There are a number of small towns in rich agricultural belts which have as yet no Independent telephone exchanges, and a fine field is open to the investor who builds such an exchange and connects the same with the smaller surrounding towns, most of which will support excellent telephone exchanges. I have under my management a town of not more than three thousand population in which we have an exchange of 287 telephones, at the rate of eighteen and thirty dollars per annum per instrument. This is one town located in a county having nearly 2,500 telephones in operation. Many of these smaller towns having a population of 10,000 or less have been built within the last year, or are now being

built, and the most valuable territory in the state will soon be taken up.

To the men who wish to construct good telephone exchanges and toll lines, among people predisposed to the Independent telephone movement, and will give the best of service and the business personal attention, our great state offers many attractions.

The homeseekers' excursions run by the great railway systems give any man an opportunity at a small expense to visit the state and see for himself that the conditions exist as I have stated.

[Read before the last annual convention of the National Interstate Telephone Association.]

## "Look for the Shield"

R. A. WALKER

Opportunity does not as a rule make many stops at the same door, but it would appear that we have been chosen as a glaring exception to that rule, that we may again and again have the chance to take up the thread where we have left or deserted it, and be allowed the privilege of taking our time and inclination of placing ourselves as a power and a unit before the people.

One year ago this organization adopted as an emblem a standard that we all might and must use, the "Shield," with a standard wording well adapted to our use. No wiser thing could have been done from the standpoint of unity and the means of showing that unity before the telephone using public.

It remains for us to make this "Shield" the greatest advertising symbol that the country has ever known. We'll make ourselves into a lodge, with this "Shield" as a badge that will identify us and serve as an introduction between Independent telephone men from one end of the country to the other. Our interests are common, our action *must* be in unity. Remember then that if we are to show a common front the Emblem must be the same everywhere. Our "Shield" has the orthodox form with these additions; the interlined word, "Independent," surmounted by nine stars and underlined with thirteen, while across the two color body appear the words "Local and Long Distance," and below in the blue stripe "Telephone." Let there be no changes, not the omission of a single star nor the change of a word. Make this thing the same from coast to coast. Some have already placed their own or corporate name in the place of the word Independent. STOP IT. DON'T DO IT. Every change that you may make will detract from the power that the universal sign should be. Let's have a Badge to tie to.

The means are at hand and have been lying dormant for the many years past that will give us the end that we desire. In the Independent telephone industry we have banded together through this organization thousands of telephone men and operating companies whose aggregate yearly expenditure for printing and advertising of all kinds would astound the heaviest publicity agents and advertisers of this advertising age. What then should be the result if the more than 6,000 Independent telephone companies will use the "Shield" on every thing that they print, such as stationery, letter heads, bills, cards, forms of all kinds, posters, directories; place a standard sign bearing the "Shield" at every toll station, office and

booth; and upon every suit of clothes wear the Badge in button or pin and see that every employee, every officer and director, is so equipped. If this were done in Iowa alone there would be more than 13,000 wearers of the "Shield" and throughout the country this Emblem would be placed before the public eye ten times a day for every telephone we have in operation or billions of times in the year. Could you imagine that the American public would not take notice of such a thing as this? Everlasting persistence is the price of success. Then let us begin now. Are you wearing a "Shield"? If not—why not? LOOK FOR THE SHIELD. Has the man next to you a "Shield"? If not have his credentials looked into. You are appointed on the committee to "LOOK FOR THE SHIELD." When you go home announce to your editor that you have been appointed on this committee and tell him that the wearers of the "Shield" are entitled to talk anywhere in the United States. At the same time put up the new sign, and pull down the Maltese Cross or any other sign that you may have been using, they may lead some poor unsophisticated one to think that you are not one of us.

Men, here lies an opportunity such as the big advertiser of "trade marks" would have been glad to have poured out a rain of gold to have duplicated and it costs you mighty little. We'll have an agent in every hamlet, village, and town in every state in the Union working with an enthusiasm that salaries fail to buy.

Don't have to be pulled and carried along, be a part of this great combined effort that is going to place this "Shield" where it will become synonymous with Independent Telephony and the definition will be changed in the dictionaries and all past meanings will be marked obsolete.

We'll inoculate the people with the slogan "LOOK FOR THE SHIELD." Don't DRAG—PULL. Don't LEAN—LIFT. Brace your heels in the ground, hold the chin in, the crown of the head high (as Macaulay did) and keep your eye on the "Shield." When you get a letter from a telephone man on which the "Shield" does not appear, remind him of the error, and if he hasn't them, that this association can furnish him with the necessary cuts, and to the faithful brother we'll write "Yours bearing the Shield," etc. It will take but a few of these little things to bring the Emblem into universal use and will so predominate as to make the "Blue Bell" one of the great finds of the "antiquity hunters."

Undoubtedly you have read the very thorough and interesting as well as effective articles by Mr. Latske, which are now being published in the *Success Magazine*, have commended them and stored them away for future reference or for the use of posterity. You have read the excellent articles appearing in the *Chicago Tribune* covering the Chicago situation and in your minds' eye have seen the time when Chicago connections would be a reality; but what ONE thing have you done to help and assist those that are pounding at Chicago's gates? They have been forced of necessity to make their fight a personal one with the small (considering the total) number that surround them. What power is there in a few small telephone exchanges with no financial listing, under innumerable names and arrangements with as many different managements? Have we in the past shown a unity of action and organization that would discredit opinions of this kind? If so what has been the sign? We must show these doubters that we are of one mind and of one purpose. When the 5,000 and more Independent telephone users in this country, brought to the "Shield" for a banner, shall march down on this commonwealth and show them that the Chicago of today is a "puny" thing compared to what it would be if connection were established with the millions of Independent telephone companies in this country, following together under one organization, the National-Interstate

Telephone Association, bearing but one sign, and shouting but one cry; there will be no need of clamoring and beseeching but this city as well as New York will meet us more than half way.

Gold would lose one-half its value without the glitter. Independent telephony loses one-half its power without its "Sign of Unity," "The Shield."

At many points, what has in the past been competition has now developed into war. Everything that can be thought of to obstruct the onward march of this Independent army is being done from "Provincial" Boston, but soon the place will be provincial indeed that has not Independent telephone connections. Every army must have its battle flag, let us not forget our's. As the "Star Spangled Banner" served as the emblem of the independence of our forefathers and is still revered and defended by us, so shall the "Stars and Bars of the Shield" stand to us and our posterity as the symbol of the independence of the American people from the control of the Telephone Trust.

Remember then that we have one common cause, one common sign, and one common cry. A power irresistible.

Forget not the slogan "LOOK FOR THE SHIELD."

[Read before last convention of the National Interstate Telephone Association.]

## Telephone Publicity—Appealing to Public Opinion.

IVY L. LEE

The art of appealing to public opinion on behalf of commercial enterprises is a matter of very recent development. From time immemorial appeals to public sentiment have been made by politicians and social reformers, with the result that the press has been freely open to them.

Up to a few years ago American corporations had proceeded upon the assumption that only two courses were necessary for them to pursue. First, to produce a commodity which the public would purchase; and secondly, to fortify themselves behind all the safeguards of the law. They were confident that their rights would be protected by the courts against all the caprices and clamorings of the people.

Within recent years there has been an awakening. Business men have come to see that the tribunal of last resort in this country is found in the judgment of public opinion—a tribunal which even influences courts of law, and sways houses of congress, and marts of trade.

At a time when franchises were to be obtained for the asking, with a government or local subsidy sometimes thrown in, it was hardly necessary for a corporation to make an appeal to the public. Franchise rights were then of very doubtful value. It was sufficient to float public service corporation securities. But with the extraordinary increase of urban population, the marvelous progress of modern engineering science, and the demonstrated revenue-producing value of public franchises, the entire situation has changed.

Corporations now realize that they must take the public into their confidence, and that they must justify their very existence. They are now coming to see that they must approach the court of public opinion exactly

as they approach a court of law, and that this appeal must be made with a due regard to the peculiarities and the machinery of the tribunal itself.

Many business institutions within the last two years might have said: Your theory is entirely correct, but the principal avenue of approach to the public is the press, and in it we are not able to make our appeal, except in the advertising columns, something expensive to the point of prohibition."

This statement would have involved the thought that although the corporation was willing for the public to know those facts about itself which it wished to offer, it was unwilling to give to the public the benefit of that information which the public itself wanted and had a right to have. The public is not unreasonable, but if there is one thing that it does demand, it is perfect frankness. A study of the art of appealing to public opinion, therefore, has involved two important questions: First, what is it that the public is legitimately entitled to know and wants to know concerning an enterprise? Second, what is the best means of presenting this material in a way to command a hearing? The fundamental fact upon which every intelligent appeal to public opinion must be based is a willingness to make the appeal with the same frankness and thoroughness as an honest, straightforward business man would employ in presenting his side of a case before a court and jury.

"Ask yourself, or ask others, what invests a piece of news with its greatest charm? Not its importance, not its influence, but its mere novelty.

You must give the newspapers, therefore, matter which has about it some element of novelty. If this is done, and if the item is true, you need never fear that it

will not be printed. Let the other side of the case be presented, too, but continue to present your own side, accurately and persistently, confident that upon the examination of the evidence, the "jury" will decide justly. It is often true that what is very old to one man is very new to the layman. It is necessary, therefore, to have expert judgment upon what is news and to have that news prepared by skilled men.

You will pardon, I trust, this somewhat academic statement, for I feel that the application of these principles in popularizing the Independent telephone movement will immediately appear. Up to this time one of the greatest obstacles to its success has been its inability to secure a foothold in the cities of New York and Chicago, for in this inability there is involved the very large general question of procuring capital for the up-building of the telephone business throughout the United States. So long as the Bell company stands safely fortified within these two great citadels, with New England still in the hands of the Bell army, there will be many people who will feel that Independent telephone securities, especially of long distance lines, are not the most attractive of investments.

I believe, then, that I am safe in saying that the reason why it has so far been so difficult for the Independent telephone movement to make its impress upon these two great cities has been due to a lack of knowledge on the part of the people of these cities of the strength, the vitality and the inevitableness of the Independent telephone.

I come to you from New York where the Bell company unquestionably gives good service, although at an extortionate price. The attitude of the company is often arbitrary and indifferent, but with all that the average New Yorker feels that the service at the present time is fairly good, and that the addition of another instrument on his desk would be almost a nuisance. He believes also that the Independent movement is in about the same hopeless class as the independent movement against the Standard Oil Company. You and I know this sentiment is based on ignorance. If the New Yorker knew there were more Independent telephones in the United States than there are Bell; if he knew that but for the marvelous vitality of the Independent movement the Bell company to-day would still be in its sickly and unprogressive state of twelve years ago; if he knew that in objecting to the advent of the Independent telephone he was depriving himself of long distance connection with the greater part of the people of Ohio and Indiana, not to speak of upper New York state; if he only knew that the metropolitan population of to-day uses some 250,000 telephones where it should have close on to a million at a greatly reduced cost, and with improved instruments, his attitude would, I am convinced, be very different from what it is now.

Your opportunity, then, is to give information. Drive the lesson of self interest home in every possible way. It is inevitable that Independent telephoning should be established in New York. Let the New Yorker and the Chicagoan be told daily of the march of your armies towards his ramparts, and the inevitable cannot long be delayed.

My personal judgment, based on a study of this subject, covering a considerable period, that the appeal to public opinion on behalf of the Independent telephone, certainly in the great cities, should not be made with the idea of eliminating the Bell telephone; but it should pro-

ceed upon the principle that competing telephone systems are of great advantage to the public, and just as a man can see less if he has only one eye, and can hear less if he has only one ear, just so is the resident especially of a large city robbed of his proper share of comfort and business efficiency by the use of only one telephone. The lesson should be driven home that the telegraph business in this country was never so effective or so cheap as it is now with two companies actively competing for the business. Let the position be assumed that the Independent telephone bases its claim for support solely upon its better service. A prominent lawyer interested in the Independent telephone movement said to me a few weeks ago:

"I believe that the Bell Telephone Company would take a most advanced step if it should welcome the growth of the Independent movement in every particular."

The Bell service is made better because the Independent service is competing with it; the Independent service is made better because the Bell is trying to distance it. The time should be very near at hand when the telephone should be available for use in the home of every workingman and every farmer in the land. This will only be the case when invention has done its utmost; when modern science has vastly cheapened the art of telephone manufacture and operation. But this fact must be impressed upon the public that this state of perfection can never be reached if the business is to be turned over to one corporation whose distinct purpose it shall be to protect its old equipment and to do only so much business as will render a return upon its limited capital comfortably secure. This question has ceased to be one of sentiment. The Independent telephone movement could not long survive if it was simply a movement of protest. You want the people to use your telephone. To the average man the question is simply where can he get the best service for the least cost. The fallacy that the telephone is a necessary monopoly must be exploded. The facts and arguments should be presented everywhere, especially in colleges where the future moulders of public opinion are being trained. Your purpose is also to sell securities. Your ability to do so will depend upon the success with which the business and the economic argument of the Independent Telephone is presented to the public. The telephone is one of the most interesting subjects before the world today. It is estimated that it has added 15 per cent of efficiency to the business which utilizes it. It has been of infinitely greater value to the people who have used it than the rural free mail delivery. It has made steps lighter; it has protected life; it has relieved panics; it promises to save country life and bring back its charm, and it has lightened the hearts and burdens of millions of people. The people today are interested in everything that concerns the telephone, no matter whether it is Bell or Independent. The Independent movement is full of the most interesting news material, which the public will read eagerly and the newspapers will print gladly, if it is only supplied to them in the right way. Every bit of your progress, the human interest incidents connected with the growth of your business, the facts concerning the resistless, inevitable march of your armies into the rural districts and toward the great cities of the country—all these are of vital interest to the American people.

On one subject I wish to be especially clear. There



has been a large amount of sinister comment on account of newspapers concerning the press bureau organized to control the news or opinions of newspapers through advertising, and which have paid for the insertion of reading matter under the guise of news. The only proper function of a newspaper bureau is the gathering of those facts concerning a business which are of legitimate interest to the public, and presenting them for free publication at the opportune time. Not a dollar should be paid for the insertion of such material in newspapers, and if the matter is not news, its free publication should neither be asked for nor expected. The success of such work depends upon the skill and honesty with which the material is collected and prepared, and upon the judgment displayed in deciding whether a particular fact has a real news value. It is impossible to "work" the newspapers, or for either individuals or interests to "use" them for selfish objects; but it is possible to accomplish important results by dealing fairly and systematically with them in behalf of causes that are just and business interests that are legitimate. The American people re-

sent any effort to control the sources of public information. If it is true that the Bell Company has subsidized newspapers\* and attempted to purchase the publication of false statements, the exposure of such practices would add more to the unpopularity of that company than any step you could take against it. The press, is on the whole upright and fearless and should be treated always in that way.

I would suggest to your Association, that without delay it shall adopt the most comprehensive methods that can be devised for informing the people of this country concerning the wonderful claims and achievements of your industry, and for laying before this powerful court of public opinion always in strict accord with the rules and the practices of the wide-awake and ever more influential American press, the attractive facts relating to your existence and your triumphant progress.

[Address by Ivy L. Lee, before the National Interstate Telephone Association at the Annual Convention in Chicago, June 27th.]

## Talks and Queries

### Protection Against High Voltages.

Editor SOUND WAVES:—We are crossing an electric line at five different places in our rural telephone lines in the country. The high tension wires of this electric line are of the three wire system and the current has a voltage of 33,000, alternating current. Suppose one of the wires were to part and fall on our telephone circuit? What would the result be? Would the ordinary fuse in the pole house and distributing rack give any protection, or would the current leap across and then burn out the entire switchboard?

How long an arc would a current of the above pressure give? Would it be a good idea not to have a ground connection at the telephone when there should happen to be a cross with the heavy voltage circuit?

I saw a place the other day where one of these wires had parted, which was right in front of a farmer's orchard. The farmer told me that he was close to the place when it happened. He stated that when the wire parted it swung too and fro, coming in contact with the ground and a good sized plum tree. The plum tree was burned black and killed, and in a circle about four feet across, the grass was all burnt out.

What kind of a safeguard would you recommend in order to be on the safe side, if such wires should happen to come in contact with a telephone circuit?

X. A. T.

You are up against a proposition that will be a real problem to many telephone companies in a few years. The perfection of means for transmission of power over long distances is going to demand entirely new protective apparatus for telephone lines and instruments.

A fuse is absolutely of no use in the protecting of telephones or switchboards. The current from a circuit of 30,000 volts may be drawn out into an arc five or six feet long if there is enough power back of it, and it will jump several inches. The most effective protection is a good grounding arrangement, such as a good heavy carbon arrestor. The insulation between the two blocks of a good arrestor will break down when subjected to a voltage of three hundred or more volts. If the carbon blocks are of sufficient size, they will carry the full energy from a very heavy power circuit of high voltage till the wire is burned in two or till the circuit breaker is thrown at the power house. Where the telephone line crosses under the

power wires, grounded guard wires should be strung directly over the telephone wires; then if the power wires should break they would strike the guardwires and throw the circuit breaker. When the telephone wires are above the power line, grounded wires should be strung across the face of the cross arms of the telephone poles, on the side next to the point of crossing and closely under the telephone wires. The guard wires should be far enough from the cross arm so that the telephone wire will strike the guard before it strikes the power wires.

The writer remembers seeing the description of a device some time ago, which should work perfectly for the protection of the telephone wires crossing high voltage leads. In this invention the tension of the telephone raised wires held the grounded guard out of contact, but as soon as the wire broke and the tension slackened, the guard was raised by a spring till it touched the telephone wire.

The real protection is to have a good ground at every telephone and a good grounding device in the shape of a carbon block arrestor.

### Bad Ground Connection.

Editor SOUND WAVES:—We have a central office for one hundred lines, but there are but eight lines connected therewith. All lines are party lines, having from eight to ten 'phones per line. We are troubled by ringing through the central; that is, a subscriber on one line may ring a subscriber on his own line and is likely to ring a telephone on another line on the opposite side of central at the same time, without having a connection through the board.

Though the rings through central are very weak, yet they cause a great deal of annoyance at times. It seems that at times this trouble is all gone.

We have one or two 'phones that will not talk when the transmitter is pushed up as high as it can go, but talks all right when it is pulled down as low as it will come.

Please give me the remedy for these two troubles and accept my thanks for the same.

F. A. S.

Very likely the trouble in your switchboard is due to a bad ground connection. If you do not have a per-

fect ground at the central office the current from any ringing current will pass out over the other lines and go to ground through the various telephones. Naturally the bells of such instruments may ring if the system is not too large. You will also find strong cross talk in this case. For a ground take some sheet copper having an area of several square feet (An old wash boiler bottom will do). To this copper solder a heavy copper wire and then bury the sheet copper at least eight feet in the ground. The copper should run up to the switchboard and to it all grounds should be attached. The copper ground wire will be better if made up of three or more strands of No. 14 or No. 16 wire.

The probable reason that your transmitter cuts off is that the insulation is worn off from the wire running from the transmitter through the arm. When you raise the arm the conductor touches the iron arm causing the trouble.

If you can raise the arm to a nearly vertical position the chances are that the granular carbon falls away from the front electrode of the transmitter and thus opens the circuit.

### A Batch of Queries.

Editor SOUND WAVES:—Will you be so kind as answer the following questions in the next issue of SOUND WAVES?

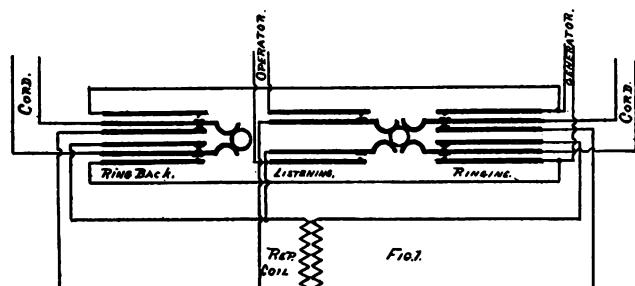
1.—In building a metallic line, would it do to put one wire on either side of two grounded lines? The grounded lines are on a four pin cross arm, on the middle two pins.

2.—Will it be necessary to have a repeating coil between this line and other lines of our board? They are all grounded lines. Please give diagram of installing said coil.

3.—We have a grounded system and last fall we put in a cable. Since then many of our bells ring feebly when not desirable. What is likely to be the trouble? B. S. B.

1. You should have the two wires of the metallic circuit on adjacent pins, or you will surely have cross talk between it and the grounded lines. If the wire for the metallic line is the same size and of the same material as that used for the grounded lines, you might string the two new wires for the grounded circuits and then change the two grounded wires into a metallic circuit. Then you would not have to transfer the old wires to a different position.

2. If the metallic line is a long one, it would be much better for you to have one of the cord circuits



equipped with a repeating coil. You then will prevent the unbalancing of the metallic circuit. The unbalancing will cause a great deal of noise on a long line. For short lines you should not have any difficulty in making satisfactory connection without a repeating coil as there would not be enough trouble to notice. Figure 1 shows the way the repeating coil should be placed in the cord circuit, if the cord circuit is the same as those that are ordinarily used.

3. You had better look carefully to your common office ground for if you have a poor one you will have the

trouble that you explain. It may be that your cable is wet and there is sufficient leakage through the insulation to cause the crosses. Paper insulated cable is especially apt to get wet if not properly handled.

### Ringing and Arrestor Troubles.

Editor SOUND WAVES:—I have two 100 drop boards, where parties are rung by a pole changer. The ringing on one board seems strong, while on the other it is very weak. Is the trouble likely to be in the switchboard ringer?

Have had an unusual number of drops burned out this spring. The lightning current would necessarily have to pass through two pairs of fuse strips, ( $\frac{1}{4}$  and 1 ampere) before reaching the drop. Will you kindly let me know where I may find the trouble?

It is a little hard to tell just what may be the matter with the pole changer as we do not know what kind of a board you have. In each board there is probably a buzzer which sounds whenever you ring a subscriber. If this buzzer should happen to be of high resistance in the one section and not in the other, you will have difficulty in ringing through the one of high resistance while there would be no trouble with the other. There is really no need of having such buzzers and you will get better service by cutting them out entirely.

If you have to ring through the drop in calling a subscriber your trouble may be due to that. When you got the first section, the drops may have been wound to one resistance and then when the other was purchased, the resistance may have been changed.

If you have only fuses to protect your switchboard, it is not to be wondered that you have a great deal of trouble. The fuse is almost useless as a protector against lightning when used alone. The carbon block arrestor is the best protection against lightning that has yet been devised. You should have each line protected by such an arrestor and then it will be very unusual to have the lightning hurt a coil. We do not mean to say that such protection is absolutely sure, for there is no perfect arrestor.

Mr. A. F. Collins of New York in the Scientific American on Wireless Telephony: "The invention relates to the art of transmitting and receiving articulate speech between two or more stations without connecting wires, but employing the earth or other medium as a means of propagation; and it relates more particularly to transmission of impulses into the earth or other medium by means of a direct or alternating current having a higher voltage and greater amperage than it has been found possible to employ heretofore and the reception of these impulses and their amplification and intensification at the receiving station."

The attention of Independent operators is centered on a number of franchise applications throughout the country, one very interesting one being that at Evansville, Indiana. The applicant here is the Citizens' Telephone Company, 56 B. M. A., building, A. J. Rousseau, general manager and director. The remaining officers and directors are as follows: A. F. Karges, president; A. P. Lahr, vice-president; Geo. L. Torian, second vice-president; James V. Rush, secretary and treasurer. The new franchise will contain but few changes. The company is planning to build a 5,000 capacity plant, strictly modern in every respect.

J. W. Stone, formerly superintendent of the Central Indiana Telephone Co., at Sheridan, is now acting in the same capacity in a telephone exchange at Arcadia.

# Telephone Situation in South Dakota

The following communication from one of South Dakota's prominent telephone men will be found of considerable interest:

To the editor, SOUND WAVES:

In reply to your request for an outline of the telephone situation in this state, I desire to say that South Dakota perhaps, holds the most unique position regarding Independent telephones of any state in the Union; in fact it is thoroughly covered with Independent lines and exchanges, with the exception of the extreme southeastern portion, where the Bell people commenced operation in the early eighties; and the Black Hills district, where that company also gained a foot-hold at an early date. Their operations have been confined to these two sections, and they have not built a foot of line, to my knowledge, nor put in an exchange in South Dakota beyond the territory mentioned, for the last eight years.

In 1886 the writer commenced building Independent exchanges as well as toll lines in South Dakota, organizing the Dakota Emmer Company, which at that time was thought to be a very strong company, including the most prominent men in the state, selected from the most prosperous and influential towns. The intention of this company was to cover the state with toll lines and exchanges as quickly as possible. It was found, however, that the people were not sufficiently educated to the necessity of a telephone system, and consequently were very slow to take hold of it. It took a month of persistent effort to secure forty subscribers at Aberdeen, which was the most hustling town in the northern part of the state; and the same was true at Watertown and Huron, where, after a two weeks' thorough canvass, the writer succeeded in getting ten pledges for telephones. People looked upon it as a luxury and an unwarranted waste of money. However, this company succeeded in installing three exchanges, one in Aberdeen, Columbia and Watertown; and built toll lines connecting Aberdeen, Columbia and Groton, and undertook to connect Watertown by toll line, but this failed, because people considered it a visionary idea. This, coupled with the attitude taken by the Bell people regarding patent litigation, caused the company to become discouraged and abandon the project; thus throwing the burden of maintaining the little system which had been established, upon the writer personally. To say that this was up-hill business is putting it rather mildly; still, the Aberdeen exchange as well as the toll line between Aberdeen, Columbia and Groton has been in operation ever since 1886, and the Watertown exchange since the spring of 1887. The business, however, was not remunerative and many people at that time thought the writer was a fit subject for the insane asylum, on account of his persistent effort to keep the system alive, which was accomplished at a considerable loss of money, as well as ten years of hard labor.

In 1896, ten years later, the situation changed somewhat, and a line was built between Aberdeen and Redfield and neighboring towns. The name adopted at that time was the Dakota Central Telephone Lines, the writer being the sole owner.

On account of the unusual weather conditions the winter following, when railways were blocked and telegraph lines disabled, followed by the unprecedented high

water in the spring, when miles of railway track as well as telegraph line were swept away; the telephone lines, having been kept in good condition, were about the only means of communication, and the people began to realize that telephones, after all, were of some consequence; and on account of the persistent effort to keep the lines in order, although often times at great risk of freezing or drowning, the business was very remunerative; in fact, proved to be the most remunerative of any lines ever built in connection with this system. Encouraged by these results, which were backed by a growing public confidence in telephone lines, additions were rapidly made, business men became interested, capital was more easily obtained and the result was that in 1898 it became necessary to incorporate a company, and from that time on the growth of the Dakota Central was somewhat rapid.

The rates charged for telephone service were reasonable, varying in exchanges from \$1.00 to \$3.00 per month, according to local conditions, toll service was comparatively low, the system being new, worked well, the expense account was small, and the profits showed up fairly well; in fact were rather attractive, to such an extent that a great many conceived the idea that the only thing necessary in order to "get rich quick" was to organize a telephone company. A severe sleet storm about Christmas of 1900, however, demolishing several exchanges, and the following March another one laying low every line within a radius of one hundred miles, made the company begin to realize that there was something besides profits connected with the telephone business; still the rates were not raised materially, the toll rates being adjusted on a mileage basis, which however caused a great deal of unfavorable comment, and stirred up many so-called Independent lines. (I have used the term "so-called Independent lines" advisedly, because the term "Independent" in itself, under the conditions existing in South Dakota, has become a misnomer.) These companies however, have found that the balance of the profit and loss account, invariably, is on the wrong side, and a great many of them have become discouraged, while the Dakota Central has gone on and improved its lines, constructing copper metallic circuits and trying to cover the field as thoroughly as possible.

In 1898 this company committed what seemed to a great many of the Independent companies, an unpardonable sin, namely finding that we were building up a system in South Dakota which had no connection with the outside world, we conceived the idea (which many others have also desired, but never obtained,) that if we could secure an outlet and make traffic arrangements with the Bell company, which then had the only existing lines anywhere near us, the value of our property would be greatly increased for the reason that many more stations could be reached, and the public consequently would receive more satisfactory service. Having all the territory we could handle and could secure capital to develop, we considered this an excellent arrangement; in fact, are still of the same opinion, as this is what has kept the Bell people out of South Dakota, and left the field open to Independent operating as well as manufacturing companies; and it is a fact that practically all of the telephones used in South Dakota have been furnished by

Independent manufacturers, with nothing to interfere with or molest them.

The Dakota Central was guilty of another misdemeanor, namely the growing to somewhat large proportions, and while it was buying all equipment of Independent manufacturers, it could not buy from all of them, and tried to patronize as many as possible, by grouping certain apparatus in certain districts, but some of the Independent manufacturers demanded that we buy indiscriminately, no matter what might be in the territory previously. Realizing that this would be impracticable and detrimental to the best interests of a uniform telephone service, this company adopted a plan of its own, and believe now that we have succeeded in getting up a comparatively uniform toll system; in fact, one that is more uniform than is found in most states of the Union. This policy however, is criticized by many manufacturers, who have not been able to unload their wares onto the Dakota Central, and while their original object was to simply wage war against the Bell Company, they have also since seen fit to make war on the Dakota Central, which certainly is and always has been an Independent company, and has done more than any other Independent telephone company has been able to do, that is to reserve practically a whole state to the Independent cause.

Notwithstanding these attacks, the Dakota Central is still doing business and in 1904 it was found necessary to reorganize in order to secure ample capital to supply the demand for telephone service. In the mean time a number of Independent telephone companies have sprung up all over the state, and I am glad to say that we are connecting with most of these; in fact, with all of them who did not announce when they first organized, that their purpose was to kill off the Dakota Central. In this way the people of South Dakota receive better service than in many other communities, and if it were not for these so-called Independent companies, who are jealous of the success of the Dakota Central, and who are always trying to induce some one to divide the service, and thus

cause the people to bear a double burden, the ideal conditions sought for by the independent telephone people, when first organized, could be found in this state. As it is, however, there are some things which are not conducive to the welfare of the Independent cause. Some one may say that this is because the Dakota Central is connected with the Bell people. I wish, however, to disabuse their minds of this erroneous idea, for there are many small companies who have no connection with the "Bell" but who unfortunately were the first to build a telephone system in their respective communities, that are also assailed by the so-called Independent manufacturers, who make it their business to even send agents into their territories for the purpose of creating dissatisfaction, and while we regret this exceedingly and think it very short-sighted, the people of South Dakota are furnished with a good reliable telephone system, being supplied with all the modern equipment known to the trade, from the common magneto board to the automatic exchange, and from the common grounded line to the best copper metallic construction, according to the necessities of the different communities. The ground is being thoroughly covered, and it is still the intention of the promoters of the company to retain this field for the Independent cause, notwithstanding efforts that are being made in other directions by the so-called Independent telephone companies themselves. Considerable new work is being done; old equipment is constantly being replaced; farm lines are being built, and so-called co-operative farm lines are being connected with the system, and we still believe that we will be able, by according our patrons universal fair treatment, to hold our position and give the people of South Dakota what we set out to give them, the best, most practical and cheapest telephone service offered anywhere in the United States.

Respectfully yours,

J. L. W. ZIETLOW,  
Pres. Dakota Central Telephone Co.

## Manufacturers Must Protect Independents

W. F. LAUBACH

"The Importance of Having Manufacturers Protect Independent Interests, by Not Selling to Companies or Individuals Desiring to Compete With the Existing Independent Companies."

Or to put it concretely, how shall we be able to satisfy the great mass of village and rural district dwellers with a service they consider reasonable in price and satisfactory from every standpoint.

I personally am fully persuaded it is in such localities, that discontent is eventually fanned into a flame of passion, which, if left alone, will develop into a menacing conflagration that cannot be checked without effort or unreasonable sacrifice of principle and property.

In treating this subject, let us first of all consider the principal factor, the individual or company who is going into the telephone business for purposes of relief from either fancied or actual wrongs by the company already in the field.

I am one, among that numerous throng of Independent operators who are always jubilantly optimistic as to the continued success of the Independent movement. I

am, however, not so much intoxicated with the successes of the past, as to lead me into the error of ignoring this unique menace to our property interests and enterprise, and with which we must deal.

As the overwhelming majority of these instances of disaffection are of rural origin we have an individual or aggregation of individuals, who as a rule are embarking in a new industry for what they believe to be mutual protection, and not for revenue. This very feature, to begin with, is most undesirable, as it puts the stockholder, so to say, in the position of a subscriber; from which standpoint he naturally looks at a proposition through a prejudiced mind. We are therefore face to face with a person or what is generally worse, with a number of persons who have scarcely any conception of the cost involved in building rural lines according to the most improved methods; still less, the cost of a city plant with its underground system, heavy pole and cable leads, complicated and very expensive multiple switch-boards, power plant and all the other multitudinous equipment and requisites; and with absolutely no thought, to say nothing of a



*knowledge*, of that source of great concern to the conscientious manager,—the operating and maintenance account.

Such then are frequently the prime movers in an agitation for a "new telephone company," because they are not receiving as they rightly or erroneously believe, the consideration they deserve; or being subscribers an inadequate service for the twelve or fifteen dollars they annually pay for telephone service in their residences, though from five to fifteen miles removed from the county seat; or in a territory, where ten to twenty miles distant, at various points of the compass, are cities or towns to all of which they demand free service for the munificent sum they pay as an annual rental. Thoughtlessly, they do not consider that each city or town has its distinctive and frequently separate company which owns and operates the system in the respective town and its immediate environment. The whole matter was very pertinently expressed by a friend, recently, in this language: "You cannot satisfy and continue to gratify the entire public,—the dear public wants too much, and the more you give it, the greater are its demands upon you."

In the second place and as another factor we have the established company, which we will assume is Independent, of course; which company unless it is a prodigy has certain localities within its domain that still require development; but as Rome was not built in a day, let us be patient with the company whose management is conservative and is possibly taxing all of its resources for financial means with which to extend this system; at the same time possessing a certain degree of that very desirable characteristic—progressiveness, as well as aggressiveness so far as the condition will possibly justify.

Because the development is not prosecuted pell mell, at the expense and to the certain detriment of the city plant, the impression is very apt to become prevalent that certain districts are purposely neglected, to their great disadvantage, and the advantage of some other locality.

The time has arrived however, gentlemen, when it behooves all of us to be up and doing, especially in the matter of rural line construction, unless we have already been quite lavish with our investment in this particular branch of the industry. This conviction has been brought more forcibly to my own mind within the last ninety days than ever before. We Independents are the exponents of a Democratic policy and we *must* follow it up if our banners are to continue in the lead of the van.

Personally, I am persuaded more flies can be caught with syrup than vinegar,—it is also equally true that men are more and more adjusting their differences by the application of the principles of diplomacy, along lines of arbitration and the introduction of other pacific means, rather than by the application of brawn and gun-powder.

In the endeavor to gratify and pacify these disaffected ones, every word and deed should be impelled by the honest thought; for *nothing* more forcibly challenges the admiration and confidence of the person at odds with you, than the conviction on his part, of your *earnest*, *honest* purpose to be perfectly frank in all matters.

"For all the law is fulfilled in one word, even in this; Thou shalt love thy neighbor as thyself. But if ye bite and devour one another, take heed that ye be not consumed, one of another" were the words of One who realized most keenly the mainsprings of human character. If the application of such principles will not still the troubled waters, and the evil day cannot be averted, then it becomes the duty of the self-respecting person to proceed with the application of other means, in an en-

deavor at self-preservation, and incidentally to prove which is fittest for survival.

Such a juncture in the drama, it would seem might be the appropriate time to invoke the aid of this association, with a reasonable hope of success, by such means as may be devised for a co-operation between the association, and the manufacturer, of sufficient honesty of purpose and principle, to abide by an agreement, for defensive and offensive purposes against such malignant poachers.

It cannot be denied that it should be one of the important functions of this association, to use all honorable means at its command, or such as it has abundant means of summoning, for the protection of the investment of its members; and to go even further, upon the principle of protection of Independent telephony in general, against the menacing, threatening, vicious and deceitful Bell-inspired associations of individuals who are either clamoring for, or profanely demanding what no honest individual or corporation can afford to give them. Thus existing operating companies are frequently either driven into making a bad bargain, or into a position of defense where they deserve our profoundest sympathy and moral support; for we all know that the average Independent company has fallen into the error of giving its patrons its wares at too low a selling price; especially is this true of the average so-called rural service.

That the manufacturer should fearlessly stand by the existing operating company, which has and will continue to purchase his product, against the encroachments of these impulsive individuals or corporations, by refusing in no uncertain language, to sell his product to them, seems perfectly reasonable; at least to the operating company about to have its territory poached upon and its organization threatened with disruption. As this is the position which the majority of existing companies already occupy or may almost certainly expect to, unless in some manner the indiscriminate sale of appliances and fixtures is checked; it seems but reasonable that the manufacturer would see a reflection of his position within a comparatively few years which would be that of the dog in the story, who sacrificed his noon-day meal, which he already had in his grasp, because the reflection in the water beneath him promised a more copious quantity.

It is my personal belief that manufacturers will welcome the day of co-operation with this and similar associations throughout the union, in their own defense, against what is undoubtedly at least to some extent, undesirable and hazardous new business.

The association will be, through the loyalty of its members in a position to do the manufacturer a splendid service, or on the other hand, to undo him if he persists in catering where the interests of members of the association are menaced. The association must be very broad in its treatment of such situations, and its integrity must be above impeachment, if it is to become the arbiter in such matters. The association should, and we believe does possess these very qualifications; its aim, object and past accomplishments are a sufficient guarantee of its disinterestedness, to the extent of being absolutely fair to all concerned; poacher, operating company and manufacturer.

"But if ye bite and devour one another, take heed that ye be not consumed one of another."

[Read before the last Ohio Independent Telephone Convention.]

# The Telegraphone

Z. B. BABBITT

About four years ago an invention termed the "Telegraphone" was announced, whereby it was possible to record and audibly reproduce telephone messages, and to erase such record without loss of record material. The basis of this discovery was surprising, as it proved to physicists that magnetism could be localized.

The discovery and invention was made by a Danish engineer, Valdemer Poulsen, of Copenhagen, Denmark.

To bring to your attention the primitive telegraphone, conceive a piece of steel wire, generally known as "piano wire," stretched between two points; take an ordinary electro-magnet and connect the coil of it in a circle with the secondary of an induction coil, the primary of which is in circuit with a microphone and battery. On speaking into the microphone, induced currents of electricity produce continuous variations in the field strength of the electro-magnet, and if we slide the electro-magnet along the steel wire, the magnetic fluctuations of the electro-magnet affect the steel wire in the form of variable magnet intensities. There have been impressed on the steel wire undulations of magnetization, a kind of writing that is permanent and which faithfully records the articulations of the voice. If the coils of the electro-magnet are connected with the telephone receiver, and the magnet made to travel over the steel wire again, the telephone receiver repeats what was spoken into the microphone; or in other words, acoustic vibrations, analogous to the original vibrations of the microphone, are produced in the telephone receiver. A special feature of the telegraphone in its different forms is the ease with which the record may be erased, it being only necessary to saturate the steel wire with magnetism by drawing it in front of a more powerful magnet so as to equalize the magnetic level differences created by a record, the wire then becoming as susceptible to further records as it was before.

One of the first machines (the one which gained for Poulsen the medal at the Paris exposition in 1900, for original electrical research), consisted of a framework carrying a brass cylinder and a magnet-carrying device, so designed that the pole-piece of the magnet traversed the steel wire, about one millimeter in diameter, which is wound upon the cylinder in the form of a helix. The arrangement being, that the pole-pieces of the magnet shall rest upon the steel wire, while the machine is recording, reproducing or erasing. This machine had a length of time record of 50 seconds, being at that stage purely scientific. The space occupied by the machine was about 15 inches by 7 inches base, and 7 inches high. It can readily be seen that as a commercial article it had no value, and that one of the first problems was to reduce the compass of the machine, this being done in various ways.

About a year and a half ago Mr. Poulsen began using an arrangement analogous with mechanical phonographs—a polished cylinder of magnetical hard material and of similar dimensions as the well known cylinders in use. The speed was about one-half a meter per second, and the pitch of the screw about 3.10

of a millimeter or about 1-80 of an inch. On account of these dimensions the pole of the magnet must be pointed. These cylinders gave good reproductions, adjacent lines showing no interference.

Mr. Poulsen, in a later form of apparatus, replaced these cylinders by steel disks about  $4\frac{1}{2}$  inches in diameter and about 1-20 of an inch in thickness. The portability of these disks, the susceptibility of receiving records on both sides, the instantaneous erasure of records at will, and the absolute secrecy of the subject matter of the record, leads one to believe it will in the future be a means of inter-communication superior to letter writing. This machine weighs about 15 pounds and is of about the same dimensions as the phonograph.

The most important step, however, in reducing the compass of the machine lay in the use of a smaller wire. The machine shown you tonight represents the latest type of Telegraphone. The wire on it being only 1-100 of an inch in diameter, has solved the question of length of record that can be made. This small machine has a time capacity of thirty minutes and as the length of record depends upon the length of the wire used, it is simply a question of increasing the dimensions of these spools to give a time capacity of two or three hours.

This machine has the ability of performing five different functions, which, briefly stated, are as follows: First, it receives dictation; second, it reproduces to the dictator; third, it reproduces to one at a distant point, the machine being under control at that point; fourth, it records conversations between two persons over the commercial telephone lines without in any way interfering with the operation of those lines; and, fifth, it records automatically, in the absence of the subscriber from the office, messages coming over the line during such absence, the machine being under the absolute automatic control from the ordinary performing function of the telephone line, the ringing of the bell starting the machine, the machine sending a signal over the line to the party talking, notifying him that the machine is running, the machine running a fixed length of time, sending another signal, then automatically stopping.

This machine is of such a size as to permit it to be placed conveniently on a writing desk or a small table.

The wire runs between two pairs of magnets horizontally on each side of it, at a speed of about 10 feet a second. The driving apparatus is a small electric motor, 110 volts, D. C. contained in the box. The record is effected by the action of the left hand pair of magnets, facing you, the other pair of magnets being used for erasing.

The switch-box, as you see, is fitted with three press buttons, by which the recording wire can be run forward or backward or stopped.

As the erasing magnet is in operation when the wire is run forward, any portion bearing a record, which is no longer required, can be utilized for a fresh record, the wire being cleaned by the erasing magnets immediately before entering the field of the recording magnets. It will be seen from this that the mere fact of making a record wipes out or erases any previous

record on that part of the wire: this enables one, when dictating, to correct an error.

This other switch-box, as you see, is connected by a considerable length of cable to the machine and is for the use of the typewriter in taking off dictation. This headpiece enables the typewriter to hear the dictation. When used for dictation or recording direct the machine is spoken to through this transmitter. The machine is set in motion by the depression of the forward button in the switch-box, and the speaker having finished, the stop button is pressed.

The typewriter, having taken as many words as he can memorize, depresses the stop button, typewrites, and repeats the process until the end. The motor does not stop dead, but reverses the running of the record for a few seconds, thereby enabling him to hear the last portion of the matter already heard. The other button enables him to run back as far as he wishes.

This application of the Telegraphophone dispenses with the services of a stenographer and also leaves the principal free to dictate his letters at such intervals as may be most convenient to himself. It also provides absolute privacy to him, a fact not to be ignored, for a communication may be of such a nature that the presence of another person is sufficient to divert the mind.

Another type of machine is used for the telephone distribution of news, market quotations, music, etc. The reproduction is audible to any number of persons, whether present in one place or scattered over wide area.

We think you will be interested to know that the King and Queen of England, during their recent stay at Copenhagen, visited the office of the Danish Telegraphophone Company, where they remained for nearly an hour and showed the keenest interest in this epoch-making invention of Valdemar Poulsen. Speaking into the instrument His Majesty said: "I am very much interested in having seen this wonderful machine and feel sure it will be of great benefit and value."

Kelvin, Marconi, Silvanus P. Thompson, Alexander Graham Bell, Tesla, M. J. Garvey, A. W. Heavyside, Dane Sinclair and many others have given autograph letters of interest and approval of the invention.

What influence is the telegraphophone destined to exert in human life?

The reproductions are true to the human voice, either conversational or in song, and the day will come when every family will have records made at frequent intervals, from the child's first efforts at speech through an entire life, and the families will prize these records as they do photographs; national bureaus will be established for the preservation of records of speeches of our public men and women; correspondence will be carried on by the use of the desk machine in preference to the present methods.

Many business transactions are carried on daily over the telephone and the day is at hand when telegraphophone records will be made of each and every transaction and filed away for reference. The telegraphophone is destined to take the place, largely, of the present stenographer and no business or professional man will think of writing his business letters, lectures or sermons.

The loud speaking device, which is nearly ready for the market, reproduces sufficiently loud to fill a

lecture hall and make it not only possible, but probable, that the telegraphophone will play an important part in the entertainment field.

Note—[Read by Z. B. Babbit of the American Telephone Co. at the meeting of the American Association for the Advancement of Science held in Philadelphia.]

### Get Franchise at Springfield, Mo.

The Springfield Home Telephone Company, of Springfield, Missouri, has been granted a franchise. W. B. Scruggs, of Kansas City, where he is known as a leading promoter and capitalist, is one of the organizers. R. W. Adams, J. L. White and Mr. Scruggs, compose the board of trustees, and have appointed T. L. Dunlap as manager.

Of this new company Mr. Scruggs is quoted as saying that \$200,000 will be put up to back the enterprise. One clause in the franchise reads that in the event that the company attempts to consolidate with, or sell out to another company, its property then becomes the property of the city of Springfield. It has the right to maintain and operate a system of telephones for and during a period of twenty years, and can lay and maintain underground conduits, poles, wires, aerial cable and all other fixtures necessary. The construction of the system shall commence within four months after the passage of this ordinance, and from the time of said construction of such telephones shall commence, the same shall be prosecuted until completed and in operation. The entire plant is to be in operation within eighteen months.

In London telephones are at last to be introduced into police stations. For years it has been a notorious fact that not even Scotland Yard was connected with telephones, and cases have been frequent where robberies might have been prevented or thieves apprehended if telephonic communication with headquarters was obtainable. Now very tardily the commissioner of police has assented to the installation of telephones connected with public call stations in several of the police stations. The first station to be connected was at Kingston, and it is expected that within a short time all the police stations will have telephones.

Word comes from Albany, N. Y., that the United Message Company, which was incorporated there some weeks ago with a nominal capital of \$10,000, has increased its capital to \$10,000,000. The company is formed to carry on a general telephone and telegraph business and to deal in the securities of telephone companies. The statement is made that the new company proposes to mutualize the Independent telephone companies (probably of New York State) to place them all under one general management, and to establish other companies. It is said there are thirty-five or forty small companies in the eastern and southern sections of the State which will enter into the compact, retaining, however, their individual names and probably a certain degree of autonomy. The new company has large plans, among which will be the operating of and purchasing for the combined companies under one head or board.

**International Convention.—(Continued)**

Secretary C. B. Cheadle responded for Illinois. He said that of the eleven districts into which the state has been divided nine have been fully organized. In this state there are 160,000 independent telephones and 30,000 sublicensee telephones making a total of nearly 200,000 telephones that can be classed when Chicago will have connection with all the independent telephones in the state. E. B. Fisher of Michigan inquired whether the Central Union company allowed sub-licensees to use independent transmitters and receivers. Mr. Cheadle replied: "They will take us on any terms." In most parts of the state the sub-licensee companies are willing to sever their connection with the Bell as soon as they be furnished with independent toll facilities.

Dr. J. F. Demers of Quebec said that independent telephony in his province was started only in 1893 and developed very slowly until recent times, but lately the progress has been very marked and the province, within a very short time, will be well covered with independent lines. There are now twelve large companies in the province, having about 7,000 telephones, with about \$1,000,000 of capital invested.

Mr. Willson, secretary of the Canadian Independent Telephone Association, said that the independent companies were started in almost every county in the Dominion, and that, notwithstanding the opposition of the Bell, which is the third largest corporation in Canada, and the fact that the Dominion has no independent telephone manufacturing concerns, necessitating the purchase of all supplies and telephones in the United States, the movement has grown and increased to one of the most important interests in the Dominion.

Ohio was represented by Frank L. Beam, who stated that on March 9 there were 248,304 independent telephones in his state and 130,080 Bell telephones. The independents have nearly 1,000 exchanges in the state. He spoke of the success which has attended the Ohio plan of district organization and congratulated the national Association on the large attendance at the present meeting, and also congratulated the Association on the fact that the states have so generally adopted the district plan of organization.

Mr. Chas. Sumner responded for Oregon. Mr. Sumner humorously remarked that he formerly was a lawyer, but had reformed and become an independent telephone man. He confessed early allegiance to the Buckeye state, but admitted that there were so many good independent telephone men in that state that he had concluded to find a field where the ground was less well covered. The states of Washington and Oregon offer a fine opportunity for independent telephone development and lend themselves logically to organization under three districts; the first district with Portland as its center, the second district comprises western Washington, with Seattle as its principal city, and the third district covers the territory east of the Cascade mountains. Mr. Sumner described in eloquent language the fight that he had had to secure the independent franchises at Portland and Seattle, and his account of the success which he achieved in both cases, and the means by which he circumvented the efforts of the Bell company in these places to prevent the securing of franchises by independent companies evoked tremendous applause from the delegates. In the case of Portland he went to the people under the provision in the city charter, granting to the voters the privilege of initiative and referendum. The people granted the franchise by a large majority. In the case of Spokane, however, there was no such provision in the charter and the city council of ten members contained six Bell adherents. The case at first looked hopeless. The council tried to prevent or defeat the passage of the ordinance by taking the matter up when he was out of town. One friend, however, in the council sought to amend the ordinance at

that meeting and brought up the objection that the matter could not be finally disposed of at the same meeting at which the amendment was proposed. The upshot of the matter was that an amendment was secured to the city charter providing for the initiative and referendum, and through the courts Mr. Sumner compelled the council, after the election, to grant a charter to his company. This grant was afterwards sustained by the supreme court of Washington. Furthermore, at the city election, which was held soon after, all of the recalcitrant members of the council were defeated. Mr. Sumner's speech was quite long, but was enjoyed by everyone and showed conclusively that the independents have the situation absolutely in hand in Oregon and Washington.

Senator Kline responded for Pennsylvania. The Keystone state has 150,000 independent telephones and 25,000 miles of toll lines. He brought out considerable applause by the statement that in Pennsylvania the independents do not fight each other. Each man's territory is respected and they confine their fighting abilities altogether to opposing the Bell. He recommended this method to the independents in other states.

**WEDNESDAY AFTERNOON'S SESSION.**

Immediately on the opening of the meeting the reports from the states were completed.

J. B. Earl responded from Texas, reporting the growth and present condition of the movement in that state.

Mr. Webb made the response from Wisconsin giving some interesting facts and figures, while Vermont was represented by the president of its association, Mr. Buzzell, whose remarks were greeted with applause. Vermont is one of the newer entries in the lists of independent telephony, and although she is so near to the home of the Bell her progress in the independent ranks has been marked and satisfactory.

Following the roll call of the states, Mr. Ivy L. Lee of New York City read an instructive paper on "Telephone Publicity—Appealing to Public Opinion," which appears in another column.

Following the reading of this paper a resolution was proposed and passed thanking Mr. Lee for the very excellent address.

**KELLOGG COMPANY DENOUNCED.**

The event of the session followed immediately, when Theodore Gary stepped forward and introduced in a somewhat abridged form the resolution quoted in the introduction to this report. Immediately upon the reading of the resolution Albert R. Smith of Tonawanda, N. Y., arose and in a strong speech supported the resolution, declaring that the users of Kellogg apparatus are traitors to the cause of independent telephony. This statement was rather too broad and he later modified it by stating that he included only those who at the present time make initial purchases of Kellogg stuff, knowing it to be supported by the Bell interests.

Mr. Raiber, representing the Kinloch Telephone company, objected to the stigma of disloyalty, saying that his company uses Kellogg apparatus and so far their conditions are such that they are compelled to use it.

J. H. Hackett made a similar statement, saying that unless the resolution as read could be amended he would be forced to vote against the resolution, as he did not propose to be put without the pale of the organization.

At this point Judge R. S. Taylor of Fort Wayne, attorney for the Kellogg company, came before the convention and started on a defense of that company, but was interrupted by Mr. Gary, who rose to a point of order, stating that Judge Taylor is not a member of the Association and not a delegate, and therefore not entitled to speak on the floor of the convention. This point was sustained by a rising vote of the convention and Judge Taylor retired.



The objections to the breadth of the original resolution resulted in its amendment to the final form as presented at the head of this report.

Harry D. Critchfield of the Milwaukee Independent Telephone company, Milwaukee, spoke for Milo D. Kellogg personally. He said that Mr. Kellogg wished him to state that the suit to oust the present management of the Kellogg company and to transfer their majority of stock back into the hands of Mr. Kellogg, from whom it was originally wrested without his knowledge or consent, is now before the supreme court of Illinois and a decision is expected immediately after the summer vacation. Mr. Kellogg wished it to be understood, and so stated in the records of the convention, that the resolution proposed has nothing to do with him personally, in order that his interests shall be protected in the event of the recovery by him of control of the company.

C. B. Cheadle of Illinois hereupon proposed another amendment to the resolution before the house, offering the sympathy and good wishes of the Association to Milo G. Kellogg in his endeavor to recover the control of the Kellogg company and assuring him that the stigma of the resolution had nothing to do with him personally and would not apply in the event he again became the controlling stockholder. His suggested amendment, however, was regarded as not germane to the purpose of the resolution and was not added as an amendment, but was later passed as an original resolution.

After W. Gilbert Thompson and others had spoken on the resolution the question was put and the resolution was adopted as amended by an unanimous vote.

Mr. J. S. Bellamy of Iowa said that he regretted very much that Judge Taylor had been excluded from the convention. He recited the services that gentleman had rendered to independent telephony and asked that someone who did vote for his exclusion move that he be recalled and invited to speak. The hint was accordingly taken and Judge Taylor was recalled and spoke briefly to the convention.

The session was concluded by the reading of an excellent paper by Mr. Walker of Iowa on the value of the shield as an advertising medium.

#### THURSDAY MORNING'S SESSION.

The convention met pursuant to adjournment, President Hoge in the chair.

After some preliminary matters had been attended to, George N. Bandy of Iowa submitted a report from the committee on Standard Operating Rules and Regulations, stating that owing to the importance of the report and the time necessary to formulate it, the committee be continued and be given leave to publish the report in pamphlet form at the earliest possible date. On motion the report was received and filed, and the desired permission to publish was given.

Following the above, Chas. S. Norton delivered a paper on "Official Organs—National and State." He expressed the opinion that the independent telephone movement has now grown to a point where a national organ is demanded.

On motion of Mr. Rhodes of Ohio Mr. Norton's paper was referred to the executive committee to take such action as the committee might deem advisable.

The chair now called on Mr. Parker of Louisville, Ky., who delivered an interesting paper on "Southern Toll Line and Exchange Development." Mr. Parker's very able paper will appear in a later issue of SOUND WAVES.

Senator Kline of Pennsylvania, chairman of the committee on Amendments to the Constitution, and By-Laws, reported for his committee. On motion it was decided to consider each section adopted as read unless there should be some objection. The constitution and by-laws as finally adopted are therefore as follows:

Article I. The name of this association shall be the Inter-

national Independent Telephone Association of America.

Article II. Objects. The objects and purposes of this association are to encourage development, foster and stimulate the growth, protect the mutual interests, promote and systematize uniformity of accounting, operation, maintenance and construction of Independent telephone interests, and to defend the same from unfair encroachment or competition, by co-operation and by such other available means as may from time to time seem advisable.

Article III. Headquarters. The association shall maintain permanent headquarters to be the office and center of the association, to which all members of state and district associations in good standing with this association shall have access both in person and by mail.

Article IV. Officers. The officers of this association shall consist of a president, first and second vice-president, a secretary and a treasurer, which latter two offices may be filled by one and the same person.

Article V. Advisory Board. The advisory board shall consist of the president of each state, territorial or provincial association affiliated with and member of this association. The president of the association shall be a member and ex-officio chairman of the advisory board.

Article VI. Executive Committee. The president shall, within fifteen days after the annual meeting, appoint from the advisory board four members, who, with himself, shall constitute an executive committee of five. The president shall also fill all vacancies in said committee within thirty days after they occur.

Article VII. Election of Officers. The officers herein provided for shall be elected by ballot at the annual meeting each year, and shall serve until their successors are elected and qualified.

Article VIII. Committees. There shall be appointed by the president, within thirty days after the annual meeting, a committee, composed of five members, which shall have charge of all matters pertaining to national or general litigation affecting the interests of this association. The president shall appoint such other committees as the association may from time to time direct.

Article IX. Annual and Special Meetings. The time and place of holding the annual meeting of this association shall be fixed by the executive committee at least three months in advance, which shall be announced through the telephone journals, provided that the same shall be within thirty days of June 1. Special meetings may be held at such other times and places as the executive committee may from time to time direct. The call for any such special meetings (stating time, place and objects) shall be mailed, at least fifteen days prior to the time of holding the same, to the members of this body, and no business affecting the general interests of the association shall be disposed of except as specified in the call.

Article X. Membership. Section 1. Any state, territorial or provincial Independent telephone association representing a majority of units in interest in such, of not less than 10,000 units, each unit to consist of either one operating telephone or one circuit mile of toll line, and having subscribed to this constitution, shall be eligible to membership in this association, upon an affirmative two-thirds vote of the members present and voting at any regular or called meeting of this association; provided, however, that application may be made in the interim between meetings to the executive committee, which may pass upon and grant such application; and further provided, that the units represented by any such applicant shall not be represented by any other organization in which they may have membership; and provided, further, that after the state, territorial or provincial organization is completed and admitted to membership in this association, no district or local organizations in such territorial or provincial association. Membership in this association, however, shall be contingent upon the payment of assessments levied (as provided for in Article XI), which assessment shall be eligible to separate membership in this association except upon the recommendation of the state, territorial or provincial association. Membership in this association, however, shall be contingent upon the payment of assessments levied (as provided in Article XI), which assessment shall in no case be less than five dollars per annum.

Sec. 2 Manufacturers of Independent telephone apparatus, manufacturers of cable and other telephone equipments or material, dealers in poles, telephone supplies and material, publishers of Independent telephone magazines and journals, telephone construction companies and firms, may become associate members

of this association by paying annual dues of twenty-five dollars each, after formal action as provided by Section 1 of this article. Additional annual assessments may be made by the executive committee with the consent and approval of such associate members. Associate members shall not be eligible to hold office in this association, nor have votes therein.

**Article XI. Annual Dues.** The annual dues shall be levied, from time to time, by the executive committee, through the secretary, who shall send out the call thirty days before the same is payable, which shall not exceed one per cent per unit per annum.

**Article XII. Representatives.** The several state, territorial and provincial associations, members of this association, shall be represented at the annual or special meeting of this association by delegates chosen or appointed by said organization, or in such a manner as may be prescribed by the constitution and by-laws of such association; but the number of delegates so chosen shall not exceed one for each 10,000 units, or a majority fraction thereof, as prescribed in Article X hereof.

**Article XIII. Quorum.** A majority of all the delegates present and voting, at the annual meetings of this association, or special meeting thereof, duly called, shall constitute a quorum for the transaction of business.

**Article XV. Duties of Vice Presidents.** The duties of the vice presidents shall be to act in the absence of the president, and perform such duties as would devolve upon the president if personally present.

**Article XIV. Duties of President.** The president shall preside at all meetings of the association, advisory board, and executive committee, and shall approve and countersign all orders drawn on the treasurer thereof, and shall be the general executive officer of the association, for the purpose of carrying on the business of the association; and shall perform such other duties as may be prescribed by this constitution of the association.

**Article XVI. Duties of Secretary.** The duties of the secretary shall be to keep the records of this association and notify all members of any general or special meetings of the same to be held; draw all orders upon the treasurer after approved by the president and executive committee, and perform such other duties as the executive committee require.

**Article XVII. Duties of Treasurer.** The duties of the treasurer shall be to receive all money of the association, and to safely keep and pay out same upon the order of the president, duly approved by the executive committee. He shall also be the custodian of any contracts or other papers, except the records of the proceedings of the association. He shall give bond of some approved surety company for such an amount as may be required by the executive committee, said bond to be approved by the executive committee and paid for by the association.

**Article XVIII. Duties of Advisory Board.** The advisory board shall meet at the place of holding the annual convention the day preceding the first session of the convention, at 10 o'clock a. m. At that time they shall appoint a committee of three to audit the books and vouchers of the association and report its findings to the convention. It shall appoint the following committees, which shall report to the convention: (1) committee on credentials; (2) committee on nominations; (3) committee on amendments to the constitution. It may be called together at any time by the executive committee upon ten days' notice, which notice shall specify object and necessity for calling the meeting. A majority of those present shall constitute a quorum for the transaction of business.

**Article XIX. Duties of Executive Committee.** The duties of the executive committee shall be to co-operate with the officers in promoting the interests of the association. They shall have the right to create the office of assistant to the secretary or treasurer, and employ one or more persons to fill these offices, who shall give their entire time to the interests of the association. They shall approve all bills of the association before payment is made. They shall fix salaries of all officers and employees, said salaries to cover actual time spent in the interests of the association. They shall be allowed actual traveling expenses, when on the exclusive business of the association. They shall assist the officers in doing all things necessary to make the organization a success.

**Article XX. Members or officers ceasing to be Independent.** Any member or officer becoming in any way connected with other telephone interests than those identified with the Independent companies shall be regarded by the executive committee as having tendered a resignation to said association. Any one becoming a member of or accepting an office in this association does so with the above understanding; and the executive committee shall, in case of resignation of officers, appoint their successors

until the next regular or special meeting of the association, when the vacancies shall be filled.

**Article XXI. By-Laws.** The executive committee may in its discretion adopt such by-laws as it may deem expedient, not inconsistent with this constitution.

The report of the committee on Standardization of Equipment was read by the chairman, Mr. Clement of Washington, D. C., after a few introductory words. This he followed by the reading of some remarks written by Mr. McMeen, which followed closely the ideas formulated by the committee in its report. The report in effect was that there is a great deal of work to be done and that it cannot be done satisfactory except by the establishment of a bureau in connection with the association to be a permanent feature of the work. In the remarks submitted by Mr. McMeen he stated that none of the committee had anything in mind approaching a mandatory or compulsory attitude on the part of the association, but that there are many small details attention to which will prevent many small losses and drains on telephone companies. It is the small losses which in the end count most. The committee felt that the methods now in use, if the best of each kind can be found, are not capable of very radical improvement, and that no resolution is possible or necessary. Mr. McMeen said that the committee could imitate the successful experience of others by digging out the best obtainable facts about all kinds of toll line hardware, cable distributing methods, fittings, ducts, wire, wire tests, etc., throughout the list writing down what is found in clear simple English, and giving these results to the members of the association.

On motion the report of the committee was received and filed. The executive committee will take up the report and act on its recommendations.

Charles F. Bender read the report of the committee on Standard Forms of Accounting, which was received and referred to the executive committee to be printed.

The report of the committee on Credentials was next received and adopted.

On motion, adjourned to 1:30 P. M.

#### THURSDAY AFTERNOON SESSION.

Convention met pursuant to recess.

On motion of Mr. Deering of Iowa the chair was requested to appoint a committee to take up the subject of free service, calls by non-subscribers over subscribers' lines, and report at the next meeting of the association one year hence.

On motion the papers of W. B. Woodbury on "Independent Advertising and Getting Results," "Revenues," by W. B. Humboldt, "Suggestions on How to Finance Small Telephone Properties," by Theodore Gary, all were submitted to be printed.

Mr. Lindemuth of Indiana presented the following resolution, which was adopted:

"Resolved by the International Independent Telephone Association in convention assembled that it send greetings to the mayor, board of public works and common council of the city of Evansville, Ind., respectfully urging upon their Honors the importance of granting a franchise to an independent telephone company in said city, in order that the citizens in said city may enjoy the benefit of modern and efficient telephone service at reasonable cost, so that the vast number of telephones used throughout the United States may be enabled to have telephonic intercourse with the citizens of said city over independent lines."

Mr. Holdoegel of Iowa next reported for the nominating committee. The report in brief nominated the following to be the officers of the association for the ensuing year, and each nominee was finally elected by unanimous vote of the convention: President, James B. Hoge, Cleveland; first vice-president, Theodore Gary, Macon, Mo.; second vice-president, C. E. Sumner, Portland, Ore.; secretary, Chas. C. Deering, Iowa; treasurer, John G. Splane, Pennsylvania.

The secretary's nomination called forth considerable debate, for while there was nothing personal or otherwise against Mr.

Deering, many members felt that the office should be given to Assistant Secretary Harney in recognition of the efficient service he has performed during the past year. Mr. Harney was very actively supported by Michigan and other delegations and the debate on the matter grew rather acrimonious, the nominating committee holding to its contention that the secretary should be a man from the operating field and the supporters of Mr. Harney saying with equal force that it was not custom in other associations and that the secretary should be a paid officer selected on the ground of past meritorious performance. The supporters of Mr. Deering responded that his record shows his competency. To this everyone consented, but the Harney supporters rallied to their banners, declaring it a matter of simple justice to recognize faithful work by electing him secretary. The debate was becoming lively when someone sent for Mr. Harney, who appeared and addressed the convention as follows:

Mr. Harney: I appreciate very much the honor which you gentlemen have shown me in the lengthy discussion in reference to my candidacy. In the first place, I believe that the executive officers at least, of this association, whose names come before the public, should be men connected with, and actively operating companies; that insofar as possible they should be representative men from every state; that when we send out our literature and our letter heads we should present a solid array and show that the men whom we have in office are men who are actively engaged in the operating field—men who are actively engaged in the telephone business. If I accept the position of assistant, I expect to work as hard or if possible harder than I did this year—

The Chairman—You can't do that, John.

Mr. Harney—And I am sure I can render more effective service if you will appoint some other man, whom I can depend upon, as secretary, that I may have the secretary to advise with in carrying out the details of any plan decided upon by the executive council.

"In the meantime, I wish to thank you for the honor, and I wish to thank Mr. Ware, and I assure you that I appreciate your recognition of my service. Gentlemen, I thank you."

Following Mr. Harney's remarks, Mr. Ware, Mr. Harney's chief supporter on the floor, moved that the secretary cast the unanimous ballot of the convention for Mr. Deering as secretary of the association for the ensuing year. The motion was carried.

Mr. Bandy of Iowa then moved that Mr. Harney be recommended for reappointment as assistant secretary at a substantial increase in his salary. The motion was unanimously adopted.

The following resolution was passed with reference to the situation in Milwaukee:

Resolved by the International Independent Telephone Association, in convention assembled, at the city of Chicago, June 28th, 1906, that it send greetings to the Mayor, Board of Public Works and Common Council of the city of Milwaukee, Wisconsin, and it urges upon them the importance of granting of a franchise to an Independent Telephone Company in said city, in order that all the citizens may enjoy the benefits of modern and efficient service at reasonable cost, and so that the vast number of Independent Telephone users throughout the United States may be enabled to have telephone intercourse with the citizens of Milwaukee, Wisconsin, over Independent lines.

Mr. Norton of Indiana presented the following motion with reference to Chicago and it was carried:

Mr. Norton: "I have a resolution and motion. I move that the Executive Committee investigate the condition of the Independent operating interests in Chicago, with a view of determining whether there are any prospects of outside independent companies to have a general connection with Chicago through existing companies within said city; and give an official report

within sixty days."

A vote of thanks was tendered to the daily press of Chicago, the Press Association and the telephone journals for the full and able reports of the convention.

A resolution of thanks was also tendered to President Hoge, to which he responded in feeling terms.

The committee on photographs reported the award of the following prizes.

First Prize: Keystone Telephone Co.

Second Prize: Lincoln Telephone Co.

Third Prize: Sioux City Telephone Co.

Honorable mention: Louisville Home Telephone Co.

On motion it was decided to print the report of the proceedings of the convention in full.

The questions in the question box were taken up and briefly discussed, during which the convention listened to an excellent impromptu address from Mr. Smith, head of the telephone department of Purdue University on the value of technical school training to young men.

After some further matters had been discussed and a resolution passed thanking the various committees for their work, the convention adjourned sine die.

### THE BANQUET.

This function, the chief entertainment feature of the convention was held at the White City Restaurant on Wednesday evening, June 27.

Col. J. D. Powers of Louisville, Ky., presided as toast-master. J. H. Shoemaker of Waterloo, Ia., poetically responded to the toast. "Change and Exchanges." He said in part:

Bewhiskered jokes and amateur rhymes  
Are the worst that could happen at banquet times;  
But it's plain to be seen that President Hoge  
Was trying to play a practical joke  
When he asked an obscure Iowa man  
To risk himself in this strenuous clan,  
And when he turned o'er these festal hours  
To Kentucky's hilarious spirit,—Powers.

To come to Chicago, I'd a strong inclination;  
And when I received that smooth invitation,  
My friends seemed quite glad to lend me the money  
To send me away; and, although it was funny,  
They said they were sure a fortune I'd make,  
From "buying the Temple," some bricks, or the Lake.  
I began, then, forthwith, to cook up a toast;  
But the first time one tries it is more like a roast.

It is very much different from pancakes and honey  
To search for a joke through McMeal's Telephony.  
I was driven around like a fiend infernal,  
Looking through McDonough's and Lichty's Journal  
For a joke that was young enough to use  
At a place like this without "blowing a fuse."  
And I waded through Bailey's "Boisterous Billows"  
With naught for my pains but sleepless pillows.

At last, in a frenzy of desperation,  
I dreamed of Milk Street's Skimming Station;—  
A speech from Boston I heard in my dream,  
All buttered with logic and served up with cream.  
If the butter proves rancid or the cream a bit sour,  
You'll know it is due to the increasing power  
Which that Skimming Station of late has confessed  
In Gotham and Chicago it has seen manifest.

The Speech, though it knew neither limits nor ranges,  
Was called by the toast-master "Change and Exchanges."  
And the speaker made plain, as the light of day,  
That no public exchange could possibly pay  
If built to compete with the 'phones now at work  
In windy Chicago or frenzied New York,—

That, exchanges now running in either city,  
Deserve the public's intensest pity;

Because, while at first a dime was minted,  
Each time a patron either called up or hinted  
That he wanted to talk anywhere on his line,—  
Exchanging his "change" into their golden mine,—  
This charge has already been cut to a nickle  
Through fear that a rival might sour their pickle;  
And if competition divides it once more,  
No more watered stock could be floated from shore.

Because, too, they need all the "change" they are minting,  
In Gotham and elsewhere for "fences" and printing  
Of news items; numberless, shrewd and expensive;  
But unavoidable while on the defensive  
'Gainst Independent Telephony's host  
That elsewhere gives service at reasonable cost.  
That Milk Street speaker was a rare diplomat,  
And, ere he got through, I scarce knew where I's at.

Continuing in the same meter the speaker recounted his awakening and paid his compliments to the New York Merchant's Association which voted against telephone competition. He aimed a shaft at a couple of Iowa men who went into an independent company, then got cold feet and pulled out for the Bell. But the independent company was a success and these men "find much greater 'resistance' when talking 'close home' than when using 'long distance.'" The speaker concluded with a prophecy of independent triumph everywhere.

Jesse W. Weik of Greencastle, Ind., responded to the toast. "The Land of the Jack-Oak and the Paw-Paw." Mr. Weik's response glowed with eloquence and wit. He paid a splendid tribute to Indiana and her people, and recounted especially the achievements of the people of the state in independent telephony.

The response of Charles E. Sumner of Portland, Ore., to the toast. "The Great Northwest," assured his reputation as a witty and eloquent after-dinner speaker. He convulsed his hearers with his swift sallies of wit and later convinced them by the solid dignity of his arguments.

Nelman F. Wing's response to "What Shall the Standard Be," brought up before the audience some of the humorous as well as the more serious phases of rural telephony.

J. Walker Barnes of Fairmont, W. Va., answered the query, "Why are we Here?" He said among other things that "we are here" to fight the common enemy, the Bell, and to learn everything possible about the best apparatus and the best methods in order that every independent shall be strong enough to keep his house in order.

The other speakers being absent, the banquet adjourned to attend the other features of interest at the White City.

#### THE EXHIBITS.

The general excellence and attractiveness of the exhibits at the International Independent Telephone Convention, Auditorium Hotel, Chicago, were so great that space prevents our giving an adequate description of even a part of them. The Association gave official recognition of the enterprise of the manufacturers in this particular, and it affords us pleasure to compliment them.

The exhibits were the most diversified and interesting of any yet brought together at a similar gathering. There were more new and practicably commercial devices brought forward than at any other one time previous.

We regret very much that it was not possible for every one of our readers to be present to avail himself of this feature alone, for it was well worth his time, money and effort.

In several instances the exhibits were made additionally attractive by an artistic floral display. The cleverness of the display cards and placard advertising was unusual. It varied all the way from a pair of old socks, a feather, to the most artistic electrical jeweled glass advertising signs manufactured.

It may be interesting to know that the intense earnestness and interest in the business on hand of the delegates, prevented their accepting the kind offer of the American S. & W. Co. of a complimentary trip to their wire plant at Waukegan. It is asking a great deal for a delegate to give up his time at such a busy season and such a critical occasion to visiting a private concern's manufacturing plant. The company should not feel at all chagrined at the inability of the delegates to accept.

#### CHICAGO IS WAKING UP.

##### Independent Line the Topic of a Meeting at the Grand Pacific.

The ways and means committee of the Chicago Commercial Association, composed of 125 of the leading business men of the city, entertained a special committee of the Illinois Independent Telephone Association and a number of invited guests at luncheon at the Grand Pacific hotel on Wednesday, June 27. The telephone committee consisted of Messrs. C. B. Cheadle, E. R. Conklin and M. Savage. Mr. Cheadle, who is secretary of the Illinois Independent Telephone Association, spoke as follows:

Mr. Chairman, and Gentlemen, of the Ways and Means Committee of The Chicago Commercial Association:

Your gracious invitation to me and to my associates here, I cannot but construe as an honor and compliment to the great independent telephone interests of our state. On behalf of those interests, gentlemen, I wish to extend to you our sincere thanks. I am not unmindful, either, of the personal gratification your hospitality affords, and for that you have my sincere thanks. Yet I shall feel that the courtesy was rather to the interests which I represent than to me or to those here present with whom I am associated, and I shall feel that my task is not wholly unaccomplished if I shall efface myself and them from your view and lead you to see the things for which we stand and in which we believe.

Had I stood here before you ten years ago, I should have been obliged to represent myself only, for the business which I now represent did not exist. I have, therefore, to deal with very modern history, to examine at close range very recent events, to consider very live issues. I shall take as a theme to-day the subject, "The relations of Chicago to the Independent Telephone Interests of Our Country." I shall not hope to have all the gentlemen here present agree with all that I may say, but I shall comfort myself with the thought that in the statement of facts, I shall be exact, and the statement of opinions reasonable and just.

It will be well to recall the fact that no utility contributing to the happiness and comfort of our people was ever so completely a monopoly as was the telephone business prior to the expiration of the fundamental patents upon which it was established. Supported and sustained by a five to four decision of the Supreme Court of the United States, most sweeping in its terms, the company controlling those patents had, for twenty years, a monopoly over the transmission of human speech by means of electrical energy, complete and perfect, as no other monopoly was ever complete and perfect.

I need not tell the gentlemen here present the policy of the company thus invested with the power to shape the destiny of our people. You know the policy of repression that has marked its history. How it made and maintained telephone service a luxury for the few, rather than a necessity for the many. How it made enormous profits on relatively small investments, rather than reasonable profits on an investment that would give to the common people the benefits flowing from such a marvelous invention as the telephone. The policy thus imposed upon the people produced profits to its beneficiaries in the company controlling this commodity, the magnitude of which we can only conjecture. In a public advertisement by a large corporation in the daily press of Chicago and New York some weeks ago, the statement was made that an investment of \$100 in Bell telephone stock twenty-five years ago would be worth \$100,000 now. This statement, so far as I know, has never been challenged. Certain it is, at least, that the company enjoying the monopoly made the most of its opportunity. At the end of twenty years less than 400,000 telephones were in use in the United States, not one of which, so far as I have been able to discover, was in the home of an Illinois farmer. Only the large merchant, manufacturer or other man of business was able to obtain its service,—men who had the means with which to pay the exorbitant price and whose necessities compelled them to have the service. What a striking contrast do we find in



conditions to-day, when competition has exerted its magic spell. Over 4,000,000 telephones in service, prices reduced, service improved to an extent deemed impossible, the farmer, the mechanic, the common laborer sharing with the merchant, the manufacturer, the capitalist in the enjoyment of a utility the importance of which is not equalled by that of any other in the world. I will take you into rural districts in Illinois in which practically every farm house has a telephone. I have in mind one township six miles square in which there is not an incorporated city, town or village, but in which there is 126 farm dwellings, more than 100 of them having telephones. You can scarcely find a merchant or doctor in the small villages who has not a telephone. You of the city may smile at the hayseed if you will, but I want to tell you that he has not been slow to avail himself of the benefits of competition in the telephone business, and get good service at low prices, while you in the city have been content to go on in the same old way, paying exorbitant prices for poor service and hoping that some day the monopoly would become converted, repent of its sins, join church and forever afterwards live a different life. You are still waiting. Gentlemen, you will pardon me; I am sure, for any apparent reflections upon your intelligence in a little story that I cannot resist the temptation to tell.

A short distance south of your city is another beautiful city smaller in extent and located on the banks of a cool stream. Its name is Kankakee. That of the river is the same. Just outside of the city and along the banks of the stream is located an institution wherein are cared for many unfortunate persons of our State. The stream is the favorite resort for fishermen who come to bathe their brows in its limpid waters and refresh themselves in the cool shadow of the trees that line its banks. One day a man, after spending the day, from early morning until late in the evening, was accosted by one of the inmates of the institution to which I have referred, with the question, "Are you catching any fish?" "No." "Have you had any bites?" "No." "How long have you been there?" "Since about eight o'clock this morning." "Say, my friend, you had better come over here with me."

Now, gentlemen, the question is, How long are you going on in this way? Are you going to continue to stand on the banks of the river of progress, fishing, until men question your sanity, or will you break away from your moorings and get into the stream and strive for and obtain the prize that so many, less favored in other ways, have obtained? But you ask, How has the farmer and the country merchant worked out this problem whereby he has become so favored? I answer, through individual initiative, just as you, my business friends of Chicago, must do if you are to be favored in like manner.

He has made it his business to see to it that telephone service was bettered, extended and enlarged. He has contributed of his time, his talents, his energies and his means to that end. You must do the same if you are to share in his privileges.

It will surprise you, perhaps, to know that there are today in Illinois more than 400 companies or associations of persons engaged in the independent telephone business. They have provided the funds, furnished the labor and materials, and established for themselves a telephone system throughout the State far overshadowing that of the Bell monopoly, and all within the space of eleven years. I have positive proof in letters which have come to my possession that the people of Chicago do not comprehend telephone conditions throughout the smaller cities, towns and rural districts, and I am not surprised that this is true when I recall the fact that for every work day during the past ten years there has been 100,000 dollars expended in the United States in building independent telephone property; that on an average, one exchange with 1200 subscribers, requiring the incorporation of three companies with 120 stockholders, has been organized and established each work day. That in Illinois one county has been threaded with telephone lines, 1500 telephones installed and \$130,000 expended every thirty days during the past ten years. When you fully comprehend the facts that I have stated you will begin to realize something of the rapidity of growth and development of this newest of public utility businesses.

There are in Illinois more than 190,000 telephones outside of those owned and operated by the Bell Companies. This number is fully three times the number operated by the Bell Company in the state if we shall omit Cook County from the calculation. I have before me reports from the counties traversed by or lying north of a line drawn east and west through the State along the South line of Sangamon County. I have taken pains to obtain from companies operating in these several counties, reports of the estimated number of telephones operated therein by the Independent companies, Bell companies and Bell sub-licensee companies so-called. I have cautioned the persons making the reports to exercise care and conservatism in their estimates, and in most cases, at least, I feel assured the injunction has been observed.

Out of the fifty-nine counties constituting the portion of the State above mentioned, nine counties have failed to make any report. Three additional counties have failed to report the estimated number of Bell telephones in service, and four others the estimated number of Bell Sub. L. telephones in service. With these modifications the number thus obtained for the territory indicated is as follows:

Independents—50 counties.....	123,538
Bell—47 counties.....	43,282
Bell Sub-Licensee—46 counties.....	19,910

The Independents above mentioned are those that have no connection with the Bell toll line, and therefore, are companies that have not now, nor have they ever had in the past toll line connection with your great city. The Bell telephones, of course, have toll line connections with Chicago, which is also true of most of Bell Sub-Licensee telephones.

A conservative estimate of the cost of telephone properties in Illinois outside of that owned by the Bell Monopoly would exceed \$16,000,000, practically all of this immense sum has been provided by the communities in which the business has been established. The merchant, local banker, manufacturer, mechanic, lawyer, doctor and farmer contributing the sinews of war that has emancipated the people from the tyranny of the greatest monopoly this country has produced. The social, religious, domestic, business, professional and political life of the people are wrapped up in and entwined with the Independent telephone business so as to make it distinctly the business "of the people, for the people and by the people" of this State, and what is true of Illinois is true of every other State in the great Central West, of which Chicago is the metropolis and commercial center. And when you remember, gentlemen of Chicago, that your city has been and is now absolutely and completely denied a connection with this wonderful system that has grown up while men slept, can you comprehend and measure the loss that your City has sustained annually from such denial?

The country merchant and manufacturer naturally seeks the line of least resistance in accordance with a universal law of nature. His business goes out over the channel most available to his command. His telephone at his elbow is the instrumentality through which he reaches his jobber. His goods are ordered, business engagements made and business life conducted along the lines of his home telephone system.

If the business men of Chicago could have set down before them in cold figures the loss they annually sustain by reason of diversion of business into other channels that would logically and naturally come to them if they had a connection with the Independent telephone system of this country, the conditions in Chicago would not continue as they are any longer than would be necessary to build and equip a competing telephone plant.

And on this subject of competition in the telephone business, I crave your indulgence for a brief season, for upon that subject depends the question of growth or repression in development, completeness or inadequacy of service, efficiency or inefficiency of operation. And on this point, gentlemen, I am very greatly indebted to Mr. Dagger, of Toronto, who shares with me your hospitality, for some valuable information and statistics, as well as thoughts concerning the same. And I but reproduce his words when I say "That I know of no place where monopoly, either private or governmental, is giving an adequate telephone service." And, "I have no knowledge of a fully developed competitive system which has ever failed to receive a larger patronage than that of a monopoly." In striking contrast to the telephone conditions existing in this country, where there is one telephone for every twenty persons are the conditions that exist in the most enlightened foreign countries where monopoly has fastened its clutches upon this great public utility. For instance, in Great Britain, where the average of intelligence we may assume to be approximately the same as our own, the proportion of telephones to population is as one to one hundred sixteen. In France as 1 to 500. In Germany as 1 to 108. In Bavaria as 1 to 129. In Austria as 1 to 734. In Belgium as 1 to 293. And even in progressive and enlightened Switzerland as 1 to 70, while in Norway, where limited competition exists, the proportion is as 1 to 59, and in Denmark, under somewhat similar conditions, as 1 to 69, while in the City of Stockholm, which is perhaps one of the most striking examples of growth under competition, the proportion is as 1 to 6. In the United States in 1894, at the close of the monopoly period of the Bell Company, the proportion was as 1 to 300.

But, gentlemen, let us look at this matter at closer range. Let us make it an affair of our own. I go to the writing room of this hotel, step into the telephone booth, and talk to you in your office across the street. For this service I pay ten cents, while as a stranger in your city I ride twelve miles on your electric lines for a nickel. From my office in Joliet I call up my friend here, Mr.

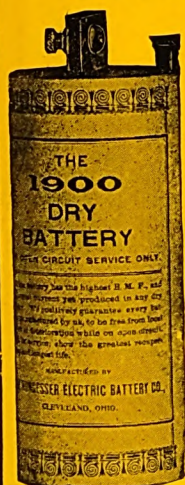


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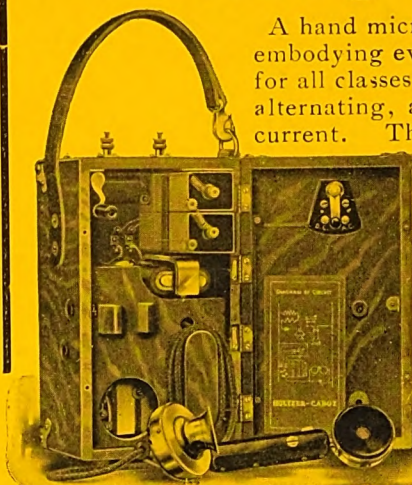
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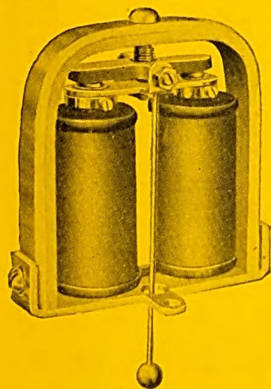
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VOL. XII  
No. 4

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SEPTEMBER  
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Published Monthly by THE THOMAS H. WILSON CO., Logansport, Indiana

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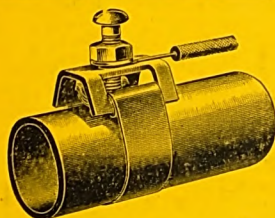
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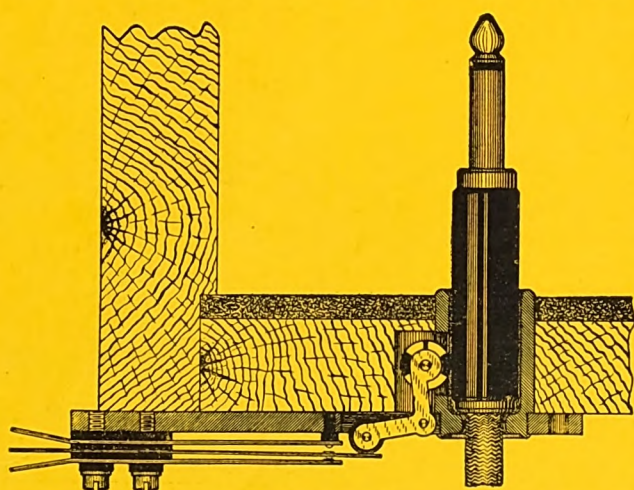
QUALITY AND PRICE DECIDE



# MONARCH



## PLUG SEAT SWITCH



The Plug Seat Switch shown in the illustration is a new piece of apparatus which embodies all of the well known characteristics of Monarch equipment. The switch springs are made of German Silver and their length insures long life and positive operation. The master spring rests against a hard rubber roller fastened to one end of the rocker arm which is pivoted in the solid brass mounting plate. To the other end of this rocker arm is fastened to hardened steel roller which passes through the metal plug seat. While the plug is out of the seat the master spring makes contact with the upper spring and the steel roller is in a position to be engaged by the plug when returned to its place. The plug striking this roller tilts the

rocker arm so that the master spring breaks contact with upper spring and makes contact with one beneath. As both points of pressure on this arm are equipped with rollers, the friction is reduced to a minimum and the device is operated easily and positively.

The hardened steel roller will stand years of usage and furthermore it saves wear on the plug handle. The rubber roller prevents sticking and affords an insulation so that all circuits brought to the switch are insulated from the mounting frame. The flat mounting frame is provided with two small lugs with holes for mounting screws. The seat itself can be made for any plug and the whole device can be mounted in any make of switchboard.

The contact points are pure platinum and they are so located that the cords cannot touch them. The connections are made at the rear of the board where they are easily accessible.

If you have a transfer system or are contemplating installing one, it will pay to learn more of this switch.

# Monarch Telephone Mfg. Co.

## CHICAGO, U.S.A.



# SOUND WAVES

A Monthly Magazine Devoted to the Interests of Independent Telephony

Vol. XII.

SEPTEMBER, 1906

No. 4

## SOUND WAVES

PUBLISHED MONTHLY AT LOGANSPORT, IND., U. S. A. PRICE ONE DOLLAR A YEAR  
COPYRIGHT, 1906.

Entered as second-class matter July 14, 1903, at the Post Office at Logansport, Indiana, under Act of Congress of March 3, 1879.

The Thos. H. Wilson Co., Logansport, Indiana, Proprietors and Publishers

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## SUBSCRIPTIONS

One Year, United States and Canada	\$1.00
One Year, Foreign Countries	1.50
Single Copies, each	.10

S. BENTELL & CO., 39 Maiden Lane, Covent Garden, London, Eng., British Representatives

## NOTICE TO ADVERTISERS

**Changes of Copy** must be in this office not later than the 1st of each month. We can not insure changes of copy being made or advertisements being with drawn after that date, as advertising forms begin going to press the 1st.

**New Advertisements** can be inserted if received by the 5th of each month but to insure proper classification they should be in this office by the 1st.

To mail the paper promptly, it is necessary for us to adhere strictly to the above, and we will appreciate the co-operation of advertisers.

**Subscriptions, Etc.—Address the Logansport Office.** In sending personal checks for books or subscriptions, include 15 cents for exchange.

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## EDITORIAL COMMENT

All communications to the advertising department of this paper should be sent to the Chicago office, addressed plainly to **SOUND WAVES**, 860 Monadnock Bldg., Chicago, Ill. All communications to editorial department, answers to want advertisements, subscriptions, etc., address **SOUND WAVES**, Logansport, Ind. Subscribers and others will confer a favor and facilitate the work of this paper by complying with the above request. Technical and news contributions will receive prompt attention and are respectfully solicited.

## CANADA'S NEW TELEPHONE LAW.

The Independent telephone operators and manufacturers of the United States have reason to congratulate their Canadian colleagues upon the passage of those portions of House Bill No. 62 which refer to the control of telephone companies.

While the amendments contained in the bill are not as sweeping as the friends of nationalization hoped they would be, yet they open the way for the building of countless independent lines in territory hitherto monopolized by the Bell Company.

The most important feature of the reform bill makes telephone tolls subject to the Railway Commission, and provides that on all long-distance business the Bell Company must exchange with independent companies.

The mandatory character of the latter provision is emphasized by a clause which confers upon the Commission the power to determine the rates to be charged for such exchange service.

An amendment, proposed by friends of the independent movement, compelling the Bell company also to exchange local business was defeated after a sharp debate.

The power of the Bell monopoly is further curtailed by the passage of a section which gives municipalities, where the Bell system is not now in absolute control, far-reaching rights over their streets.

Under the original charter of the Bell company it could erect poles and string wires upon the streets of any city or village in the Dominion without the consent of councils or other authorities.

Now local administrations can control that right or grant the same privilege to other corporations.

The new law will result in the immediate inauguration of independent telephone systems all over Canada.

Exchanges planned for some time will be established without further loss of time and the municipal owner-

ship idea, which has many followers in the Dominion, will be exploited with renewed vigor by its ablest advocates.

In the United States the progressive telephone reformers prefer private enterprise to municipal ownership.

It is an established fact that here private corporations can build more economically than municipalities and some contend that they can also operate exchanges at less expense.

However, conditions are somewhat different in Canada and municipal ownership may prove to be quite a success there.

Certain it is that the new law affords independent operators exceptional advantages.

They can establish profitable exchanges in hundreds of localities and wrest as many more from the control of the Bell monopoly.

Should the municipal ownership idea prevail eventually, they can sell their plants at a reasonable profit.

One thing the independents of Canada should bear in mind constantly.

In building their lines they should use none but the best and most modern equipment and apparatus manufactured by reliable houses and superior to those in use by the Bell company.

Cheap equipment always leads to dissatisfaction and eventual failure. It is a penny-wise and pound-foolish economy.

The people of the United States are watching with interest the development of the telephone field by the Canadian Independents.

Their faith in the enterprise of their cousins across our imaginary northern border, this journal believes, will not be disappointed.

### AFTER THE BATTLE.

SOUND WAVES is proud of the record it made in its fair-minded campaign against certain Bell-tainted manufacturers who posed as Independents and thereby obtained money from unsuspecting operators to fight the cause of Independent telephony.

The National convention was so impressed by the logical arguments of this paper that it passed a resolution, virtually prohibitive in character, aimed at the firm in question.

In its agitation SOUND WAVES was actuated by devotion to Independent telephony.

It was "subsidized" only by honesty of purpose and did not receive one cent of money from any Independent manufacturer.

Had the editor, manager or publisher accepted compensation in any form all reform efforts would have been futile.

SOUND WAVES is not controlled, either directly or indirectly, by any telephone manufacturer, operator or agent.

Its editorial columns reflect the opinions of no individual engaged in the production of telephone apparatus.

Its advertising columns are reserved for manufacturers and dealers who are part of the Independent movement and entitled to a fair profit on their investments.

In no circumstances will it publish announcements for any firm, or firms, the bulk of whose dividends is set apart to promote the interests of the Bell system of telephone monopoly.

Independent operators who purchase apparatus from such a firm are short-sighted and disloyal to their own interests, no matter how alluring the bait that may be thrown out to tempt them.

The Spider and the Fly in a modern version; but the same old invitation: "Will you walk into my parlor?"

"You are very, very kind, sir, but I thank you," says the New Fly, who is a close observer of events in the business world.

The International Association and SOUND WAVES have reason to be proud of the anathema hurled against them by the enemies of honest telephone competition whose anger proves that they have been hit in a vital spot.

Facts that for a time were dark and peculiar are now clear as day and no Independent operator can plead ignorance in the premises.

Yet the struggle is not over.

The first battle has been won, but the resources of the enemy have not been exhausted.

Backed by unlimited capital and a cleverly organized publicity department he will endeavor to neutralize and overcome the effects of his defeat.

Victory will not be permanent until Independent operators from one end of the country to the other buy none but Independent equipment from Independent manufacturers and dealers.

### THE TRUTH ABOUT GLASGOW.

After much debating and haggling the city of Glasgow has abandoned the telephone business.

The corporation has sold its plant to the British Post Office for the sum of \$1,525,000; just \$25,000 less than the valuation placed upon it by Mr. A. R. Bennett, the consulting engineer.

There is no doubt in the minds of impartial observers that the sale was forced by the government which was determined to perpetuate the system as a state-owned monopoly after the expiration of the license of the National Telephone Company in 1911.

Conditions were imposed upon the corporation which made the further financing of the undertaking, without serious loss to the taxpayers, impossible.

Opponents of municipal telephony ascribe the failure

of the Glasgow enterprise to lack of sound business judgment.

While it is true that the equipment of the plant was somewhat antiquated, especially from an American point of view; yet, if the city of Glasgow had been unrestricted in its borrowing powers, and had had an unlimited period in which to operate, instead of only seven years, the result would have been quite different.

Even the bitterest political enemies of British municipal telephony (who, by the way, are men of the same type as those who oppose Independent telephony in America) admit that the Glasgow experiment caused a market reduction in telephone rates.

More than that. When the municipal exchange was inaugurated in 1900 there were but 7,000 telephone subscribers in the city of Glasgow. Now there are no less than 38,000.

The National Telephone Company, a Bell organization, exacted an annual rate ranging from \$125 down to \$50. The corporation made a fixed charge of \$26.25 and forced the National Company to reduce its rates to \$50 for unlimited service and \$6.25 for party line service.

Ever since the corporation exchange was opened the Bell monopoly fought it in parliament and out of it.

The municipal service was held up to ridicule and its advocates subjected to contumely by the paid barkers of the National Company.

The sale of the Glasgow corporation exchange is not the result of dishonesty in administration.

It was caused, as has already been stated, by financial difficulties not readily understood in this country and by limitations of its franchise.

The British Post Office will take over all the property of the National Company in 1911 and operate the telephone service as a national enterprise for the purpose of protecting its large and unprofitable investment in telegraphs.

That the Glasgow corporation was true to its faith in municipal as against private ownership is evidenced by the fact that it refused to sell to the National Company, although the latter offered a higher price than that finally accepted from the government.

Such devotion to principle merits the highest commendation and should be an inspiration to the Independent operators here and in Canada who are subjected to Bell attacks and lampooned by Bell scribblers.

There is yet another lesson for Independent operators in the Glasgow situation.

In installing lines and exchanges they should avoid the purchase of antiquated equipment and in fixing rates make allowance for the accumulation of an ample sinking fund.

The life of telephone apparatus is short at best and the replacing of equipment must not be charged against the capital account.

The public does not expect telephone companies to operate their lines without a profit. Every subscriber is willing to contribute his share toward keeping the service in up-to-date condition.

All the people ask is that employees shall be paid fair, not exorbitant, salaries; that the instruments they use shall be modern and convenient, and that the stockholders shall be satisfied with fair dividends.

On this basis scores of Independent companies have made a success in localities dominated for years by Bell influences.

And on the same basis Independent telephony will prosper not only in the United States but also in Canada, which is entering upon a new era in telephone development.

### THE CHICAGO SITUATION

An Associated Press dispatch was sent out from Chicago a short time ago which attracted the attention of Independent telephone men all over the country.

It was to the effect that the Illinois Tunnel Company had made arrangements to give connection to lines operated by the members of the International Telephone Association.

In Chicago, it must be admitted, this good news was received with considerable reserve, as the public was—and many casual observers still are—under the impression that the Tunnel Company has close affiliations with the Chicago Telephone Company.

President Albert G. Wheeler of the Tunnel Company denies this, however.

To the editor of SOUND WAVES he stated that his company would open the transportation end of the underground enterprise on August 16, and that immediately thereafter the development of the telephone franchise would be considered.

President Wheeler further stated that negotiations would be taken up with all outside Independents.

He was emphatic in announcing that no company would be favored with an exclusive contract, but that all, without distinction, would be permitted to connect with the Chicago Automatic Telephone Company on an equal footing.

The Illinois Tunnel Company controls the underground conduit absolutely and its franchise rights are as exclusive as legal ingenuity can make them.

Looking at the matter from a perfectly unprejudiced point of view it must be admitted that the tunnel system affords the only hope of the rapid installation of Independent connection between Chicago and the outside world.

The Illinois Manufacturers' Association have prepared a franchise ordinance which will come before the Chicago city council early in September, but even its most enthusiastic advocates do not expect early action.

On the other hand, the tunnel is ready for the recep-



tion of connecting cables and wires, and if the Tunnel Company means business there need be no delay in making the Bell Company's monopoly a curse of the past.

The merchants of Chicago lose millions of dollars every year by being cut off from communication with the thousands of subscribers to Independent telephones.

The Independent companies are prepared to meet the terms of any company that will give them entrance to Chicago more than half way.

The Illinois Tunnel Company now has a magnificent chance to make good its claims that it is a "people's enterprise."

The Chicago public wants telephone competition and any corporation that will help them to get it will be granted forgiveness for past offenses, provided any are charged up against it.

### ONE DOLLAR PER YEAR.

On and after October 1 the subscription price of SOUND WAVES will be one dollar per year.

From now on until the date mentioned subscriptions will be received at the fifty-cent rate, for as many years as the subscriber may elect.

The increase in price was made after mature deliberation.

The editor believes that the average American is willing to pay a fair price for a good article.

SOUND WAVES unquestionably is the leading and most progressive monthly telephone publication.

It is full of interesting, bright technical articles, readable comments, bright advertisements and helpful illustrations.

It is the recognized champion of Independent telephony, the friend of the operators and the representative of progressive manufacturers.

While its advertising patronage has been growing rapidly it has devoted its increased income to improving the literary, commercial and technical departments.

Many readers have from time to time suggested the expediency of raising the subscription price; but the publishers declined to act upon such hints until satisfied that the improvements made would justify the action.

That time has now arrived.

Even a superficial glance at the pages of this journal will convince any fair-minded person that it is worth \$1 per year.

### HUNGARIAN TELEPHONE DEVELOPMENT.

In this issue will be found a very interesting article on the telephone development in Hungary.

The writer seems to think that the exchange in Buda Pesth is of very large dimensions.

No doubt for Europe an exchange of 10,000 subscribers is a very large installation, especially in a city of 400,000 people; but compared with several of the cities of this country the system is quite small.

There is scarcely a city in this country that does not

show nearly twice the number of telephones for the population.

The author has stated that there is a large proportion of very poor people in Hungary and, taking that into consideration, the showing is very good.

The illustrations shown would give the reader to understand that switchboard construction has not reached the high degree of advancement of American practice, neither do the boards have the graceful appearance.

On the other hand, the telephones show much more work and are real ornaments. It would be curious to know how many telephone companies in this country would be willing to pay for the extra work done on such instruments.

A curious custom is the use of two receivers to each telephone. This is almost unheard of in this country.

There is an actual gain to the subscriber in having two receivers. There seems to be a great increase in the volume, and in noisy places it is found that conversation can be carried on much easier with the two receivers.

### South Bend Exchange Sold.

One of the most interesting telephone deals of the year is the purchase of a controlling interest in the South Bend (Ind.) Independent exchange by Joseph Harris, vice-president of the Automatic Electric Co., of Chicago, and others from the Fort Wayne owners of the stock. It is the intention of the new administration to equip the exchange with new apparatus and to develop the local field in every direction. But the main purpose is the creation of an exchange for the handling of long-distance business between the east and Chicago. The new company expects to secure connection with Chicago through the Illinois Tunnel Company, which is compelled by its charter to maintain a telephone line and which now operates the Chicago Automatic Telephone Company. The location of South Bend would make it an ideal local point for long-distance work, and the new management showed wisdom in selecting for that purpose a city from which it is sure to get a big local business. It is expected that \$100,000 will be expended by Mr. Harris and his associates before the equipment contemplated by them has been installed.

### Advertisements by Telephone.

A clever scheme of utilizing the telephone in connection with its advertising department is reported to be in use at Wilmington, Del., where an arrangement has been made by a newspaper with a telephone company by which any of the slot instruments of the company in that city may be used for the transmission of an advertisement to the office of the particular paper referred to. This is a great convenience to those desiring to insert want and other small advertisements. It is only necessary to call up the newspaper office and state what is wanted, when the clerk will direct the would-be advertiser what amount of money to place in the slot. This formality having been complied with, the advertisement is read to the clerk and copied by him and duly inserted in the paper.

# Advertising and Methods of Securing Toll Business

W. H. WADSWORTH

Proper advertising in the telephone field is probably one of the most difficult problems in commercial business today. It means a tremendous amount of money and untiring efforts to bring results, and it must be done constantly and systematically at least once a month and especially the toll feature, for the reason you are catering to the public at large.

Advertising has two branches; one to reach the transient business, the other the legitimate subscriber. *Advertise to become generally known*, and if this result is accomplished, you will reap results in revenue from transients who patronize pay stations and public telephones. Advertising by personal solicitation is the revenue getter from the legitimate subscriber.

It is a most difficult problem to advertise for the purpose of instilling into the minds of the public the fact that a new system for local and long distance connections, born only five years ago, has been established and stands ready to compete with an old established system of thirty-five years' standing.

To overcome the millions of signs of the Blue Bell, to overcome that "awful habit" the public has of rushing to a Bell 'phone, to overcome the confidence the public has that in order to receive good service and a service that goes all over, it has to use the Bell (all this due undoubtedly to the fact that our competitor has brought this condition about by a system of education of thirty-five years' standing, is a tremendous undertaking and has been successful undoubtedly to the unbounded enthusiasm of independent workers who labor from sunrise to sunset, yet they concur with us in saying that the telephone and our use thereof are only in their infancy. The long distance service is the backbone of the telephone business, therefore it behoves us to cater to and to give this part of the business our careful attention. Install desk telephones, etc. If a telephone is at a man's elbow, where he will see it, he will use it more readily than if it is out of sight in a secluded part of his office. A telephone placed in a position that is the most handy to the subscriber encourages its use. Pay stations in public places are money makers, especially in hotels, railroad stations and public buildings. The traveling man of today contributes 50 per cent. of the toll business. Place the public 'phone in the way of traffic—a telephone seen is the greatest reminder for its use a company has.

Advertising the toll business is a phase of advertising that requires planning and a great deal of hard work, with plenty of nerve. Advertising on blotters, folders, cards, etc., should all be expressed in as few words as possible. Put your business to the public in as few words as possible and as often as possible. Don't talk about your common battery system; don't converse on your extensive amount of copper wire and don't say too much. Let the public read your advertisement at a glance. Write your advertisements so they will make the public ask questions, and wonder what you have. Tell the extent of your system and not only mention the towns you connect with, but also the number of subscribers in the towns. Talk about your reasonable rates and above all your efficient service. For example:

A traveling man will take the train that will give him the fastest service and the best accommodations, regardless of price. The same condition exists in the tele-

phone field. Give service that can be depended upon at all times. When you secure a man's service, the next thing is to keep it. It takes only one poor call to discourage a man in using the toll lines, especially where he has two systems to depend upon. I consider the independent shield alone more information than you can put into a thousand words. It speaks for itself. Never lose sight of it on printing matter or stationery.

Our display advertising matter is carried by all of our traveling solicitors, who, when they are on the trains, pass through the smokers and passenger coaches, handing one here and one there, entering into conversation with traveling men and educating them in the use of the independent lines. Many times have we seen Inter-Ocean solicitors approach a man who is about to enter a Bell booth and say to him, "Did you ever try using the independent lines?" Invariably he will say, "I did not know they reached so and so." You inform him of his ignorance, leave him and meet him again in your travels and he approaches you with a smile and says, "Hello, Mr. Telephone Man. I used your lines that day and have given you lots of business since. How much are your coupons?" We have seen this happen at least 100 times and have been a party to the same proceedings.

## PERSONAL SOLICITATION.

The toll department knows just how many subscribers it has to deal with from the local company's list. We

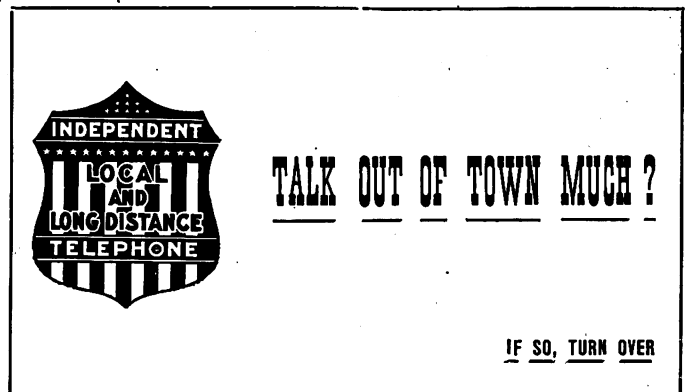


FIG. 1.—SHOWING FACE OF CARD USED IN ADVERTISING TELEPHONE FACILITIES

have our allotted field and know which 'phones are business and which are residence. We call on each individual subscriber and have a short talk with him and explain where the system reaches. We show him wherein we will be and have been the means of improving his service and reducing his rates. Get him interested and show him where he can secure business by 'phone. Instill into his mind the advantages he can have by its use—in fact, educate him. Call him often, say once a week, and don't spend too much of his time. Short calls make long friends as a rule. If you put your head in the door and find him busy, just ask him how his service is. If you find him at liberty, start in and try to interest him in a proposition. Find out to whom he talks, and if they are not independent subscribers, correspond with the Company in the town in which they are located and make an effort to secure them as subscribers. Also find out the names of the towns to which he talks. All

of this is of great value in developing a system, for when your company reaches these towns and builds these exchanges, the information you have filed is of great importance. When the new exchange is open, go to the various subscribers and secure their business.

The Inter-Ocean Telephone & Telegraph Company has a complete follow-up system in its toll department, having a card for every subscriber, which gives information relative to where the subscriber talks and the amount of business he contributes to us each month. Selling long distance service is exactly the same as selling a mercantile article. Your position is just as dignified and even more important, especially at this time when it is becoming such an important factor in the business world. Don't lose track of the small towns and villages—the produce dealers are large users of long distance telephone lines.

The Inter-Ocean Telephone & Telegraph Company, operating in western New York and northern Pennsylvania, has an established toll department of personal

WE HAVE 75,000 INDEPENDENT TELEPHONE SUBSCRIBERS  
IN WESTERN NEW YORK WHOM YOU CAN REACH BY NO  
OTHER SYSTEM. OUR LINES REACH EVERY BUSINESS  
HOUSE, IN THE CITIES AND VILLAGES IN THIS TERRITORY.  
IT WILL BE TO YOUR ADVANTAGE TO USE THE SYSTEM  
WHICH GIVES BETTER RATES, BETTER SERVICE, BETTER  
TREATMENT, THAN YOU HAVE EVER BEFORE ENJOYED.

**INTER-OCEAN TELEPHONE and TELEGRAPH CO.**

TOLL COUPON SOLD AT DISCOUNT.

FIG. 2.—REVERSE SIDE OF THE SAME CARD, SHOWING WHY  
THE INTER-OCEAN LINES SHOULD BE USED

solicitation, with a corps of solicitors selling an average guarantee advance business of over \$2,000 per month, per man, covering every town and city where we connect and making friends of every subscriber. The result of this work has been enormous. This in my opinion is the best method of securing toll business.

The independents, in approaching a subscriber who has two systems, have to overcome a tremendous handicap at the start. They approach a man who has been in the habit of using the Bell system since the inauguration of his business. He knows that with that system he can talk all over, not within 100 miles but 1,000. Since the Bell Company have been meeting the independent rates, he can get a greater scope of service at the same price and at the same discounts. The independents have to overcome this feature. You ask him for his business and he will hesitate and say to himself, "Why should I invest in two companies where one can give me unlimited toll service and the independent only give me limited toll service and the independent only give me limit to his sense of justice and ask him to give you the portion of his service that you can handle. He will gradually see the justice of your argument and you will see a toll increase from his telephone that will astonish you. We may be wrong in this statement, but don't believe that "sentiment" enters into the telephone field today. The excitement of competition has worn off and the foundation of securing the telephone business today is service and good treatment at a reasonable price.

When the independents started, the public smarted

under the harsh treatment of the Bell, but the Bell has seen the folly of this and is not only treating the public fairly, but is going to such ridiculous ends that it furnishes service below the cost of operation.

Another good advertising proposition that can be established is the coupon sold at a discount. All companies undoubtedly have them, but let us not make a mistake by doing as the Bell have done, that is, each company furnishing a separate coupon. A coupon that is good all over and will be accepted by all companies is the proper one. The Bell has found this out and today is selling combination coupons. Why should a firm which transacts business all over the country and which has traveling men be compelled to buy a separate coupon for each territory the men travel in? They have to stop and think and inquire which coupon is good in the town they are in. Telephone service looks the same to them in one town as it does in another. One coupon for the system of independent companies could secure more toll business for everybody concerned than the way it is at present. This system would appeal especially to the country's large packing houses, etc., which operate all over the states. What incentive is there for a man to buy service in one place that is not good in another?

Never lose an opportunity to become known. When your solicitors go into a town, have the company's name together with his name in the newspapers. Have all the employees, and especially the men who are dealing with the public, talk telephone dream telephone and keep talking all the time. The public like it and your solicitor will become so enthusiastic that the man he is talking to will enthuse with him.

Never lose an opportunity to boost the independent game—think up new stunts and new schemes all the time. Don't knock the other fellow; it will take all your time to boost your own ideas. Remember the other fellow has 30 years the start of you. Keep plugging and pounding at the public; it is bound to bring results.

One of the advertising folders used by Mr. Wadsworth in his advertising campaign for the Inter-Ocean Telephone & Telegraph Co. is eighteen inches long, three inches wide and folds into three divisions each six inches long. It is printed in blue on a white paper of fine, tough quality. The front page is decorated with the shield in the center is red, white and blue, and is entitled, "Facts for Everybody." On the back of the folder, in good, clear display, is the following: "USE INDEPENDENT LINES AND BE CONVINCED that the INTER-OCEAN TELEPHONE AND TELEGRAPH CO. can give you LONG DISTANCE SERVICE that is BETTER AND CHEAPER than you have ever BEFORE EXPERIENCED."

"TO SAVE MONEY CALL TOLL OPERATOR AND INQUIRE IF WE HAVE THE CONNECTION."

"DISCOUNT your BILLS with COUPONS."

On the next outside page is the following:

"READ THIS, MR. BUSINESS MAN, THEN COMPARE YOUR CONDITION OF FIVE YEARS AGO WITH TODAY, THEN ASK YOURSELF WHO'S RESPONSIBLE."

On the first inside page of the folder appears:

"You never considered talking out of town before we came. Why? High rates and limited service.

"Your long distance service is indispensable now. Why? Low rates and unlimited facilities. You know who brought this about.

"You cannot deny that rates have been reduced forty per cent.

"We connect with 75,000 subscribers that can be reached by no other system.

"Five years ago telephones were few. Rural districts only dreamed of telephones then. Couldn't get them. But it's different now.

SECOND PAGE.

"Remember you were at the mercy of a grinding monopoly once, with their high rate and generally poor service. It's different now.

"Every fight the people have made for low rates has been fought through the medium of the independent service.

"Do you know there are 90,000 independent telephones in western New York that can be reached by no other system?

THIRD PAGE.

"Nearly every town, village and hamlet is enjoying independent service.

"The growth has been tremendous.

"Rates have been reduced.

"Service has been made prompt and reliable.

"Everybody has an independent telephone.

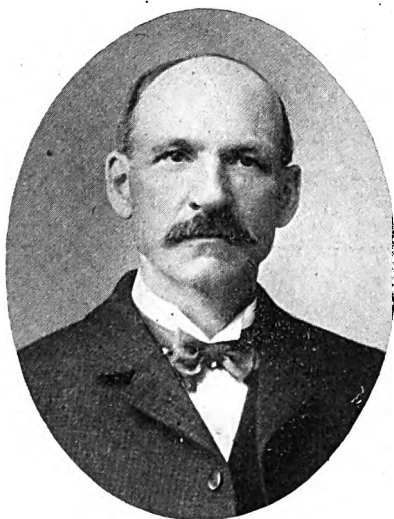
"Isn't it so?

"And we admit—

"We are responsible."

### Successful Meeting Down East.

The Vermont and New Hampshire Independent Telephone Association held its third convention at Woodsville, N. H., July 10. The attendance was large and the best feeling prevailed. President H. W. Buchanan, of Barton Landing, Vt., presided with his usual grace and dignity and spoke enthusiastically about the growth of the Independent movement. He advocated the appointment of a committee to frame a law compelling all telephone



G. W. BUZZELL, Secretary

Vermont and New Hampshire Telephone Association

companies to give service, without discrimination in prices, in any place or county in Vermont or New Hampshire; that is, fixing it so that no company can charge in one city or town \$25 for the same service it gives in some other locality for \$12 or less, when coming into competition with an Independent or home company.

O. D. Eastman, of Woodsville, N. H., stated that his 'phones had been removed from all stations of the Boston & Maine railroad through the influence of the Bell company. He pronounced this state of affairs intolerable and urged a remedy through legislation. His plea was not for unreasonable privileges, but equal rights.

G. W. Buzzell, of the Citizens' Telephone and Telegraph Exchange, St. Johnsbury, Vt., thanked the ladies interested in the Independent movement, and said they were worthy of much praise for their good work. He said that one lady had the knack of displacing more Bell 'phones than two men. He gave a brief talk on the Independent situation as he saw it from a bird's eye view at the National Independent Telephone convention at Chicago. He further said: "That we Independents may know one another, let us use the 'shield.' The National Independent Telephone Association has been organized to look after our interests as a national body, and have sent out as our unity cry, 'Look for the shield.' Put the shield on your signs, letterheads, envelopes, cards, and wear a shield button on the lapel of your coat. Let every Independent man and woman wear a shield. Talk shield and think shield, and look for the shield and work for the cause the shield represents. If you see an Independent without a shield, ask him why he does not wear it. It is an emblem and stands for our cause just as much as the stars and stripes stand for liberty. 'Look for the shield.'"

### Wireless Tangles Up Phones.

The City of Traverse is the name of a Lake Michigan steamboat dedicated to the gambling fraternity. After the "bookies" had been driven out of Chicago they resorted to the waters of the great lake to ply their calling. The boat sails every day from South Chicago, where a wireless telegraph station has been erected to transmit racing news to the gambling passengers. The other day merchants in the business district of South Chicago complained to the police that the wireless station at Commercial avenue and Ninety-second street, from which messages are sent to the outlaw gambling ship, interferes seriously with their telephone service. Messages, they said, are interrupted and all manner of strange noises come over the wires.

"Scores of merchants declare the noises too much for them," said Police Capt. O'Brien, "but I can do nothing. The vibrations of the tower and its guide cables also fill the air with strange, whizzing, singing sounds."

The tower, 117 feet high, was erected after an injunction had been secured by the telegraph company restraining the city from interfering with it. It stands in a square in the business section of the suburb.

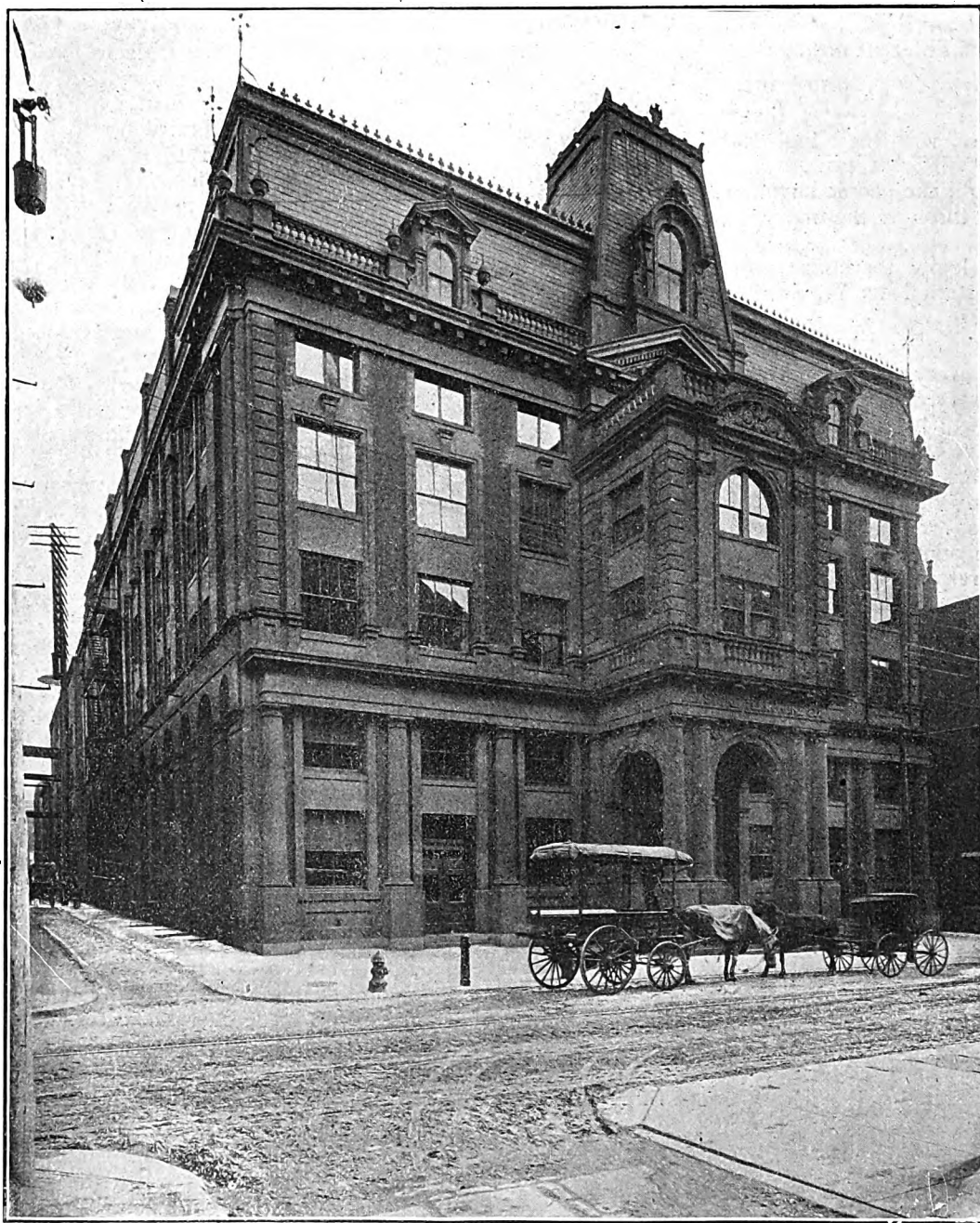
### Wonders of the Ampliphone

A late invention which may prove of considerable practical value, although at present it is yet in the sensation stage, is being perfected by Walter Wolfe, an electrical engineer, and Austin Granville, a chemist, of Muscatine, Iowa. The new device is called the "ampliphone," and by it musical sounds, instrumental and vocal, may be transmitted over telephone wires. Several prominent citizens have interested themselves in the invention and a syndicate is now being formed which will see to its speedy development. If the invention proves a success fine concerts may be heard many miles away.



# Independent Telephony in Philadelphia

BY JOHN W. KELLY, JR.



MAIN EXCHANGE, 135 SOUTH SECOND STREET, PHILADELPHIA.

THE KEYSTONE TELEPHONE COMPANY OF PHILADELPHIA, less than five years ago, entered a field which had been occupied previously by a monopoly, whose charges for service had made the telephone a luxury to be enjoyed only by the few and the wealthy. Within that period it has, by honest competition, made Philadelphia one of the most extensive employers of telephonic service, per capita, in the United States. This competition has not been destructive in character, but has been based on the installation of a superior form of service, created with a view to permanence and a logical inexpensive extension to meet future requirements. Philadelphia telephone needs are still far from

being met, and it is due to this independent company that the citizens are now very generally adopting the "phone" as a home necessity, as has been done previously in many smaller cities wherever independent movements had been started and made welcome.

The Keystone Telephone Company has been in actual service since January 1st, 1902, when the first exchange at its main office, on the corner of Second and Sanson streets, was opened. It now maintains six exchanges, (Main, Race, West, Park, East and North) and has installed at this date 22,000 telephones, to which number additions are being made daily.

The exchange buildings were designed and built with

special regard to telephone business, and they are all either fire-proof or semi fire-proof.

All of the buildings are well built of hard brick, with artificial stone trimmings and are alike in general appearance and interior arrangement, with the exception of the first building, which was re-constructed, the walls of the older building being utilized as far as possible.

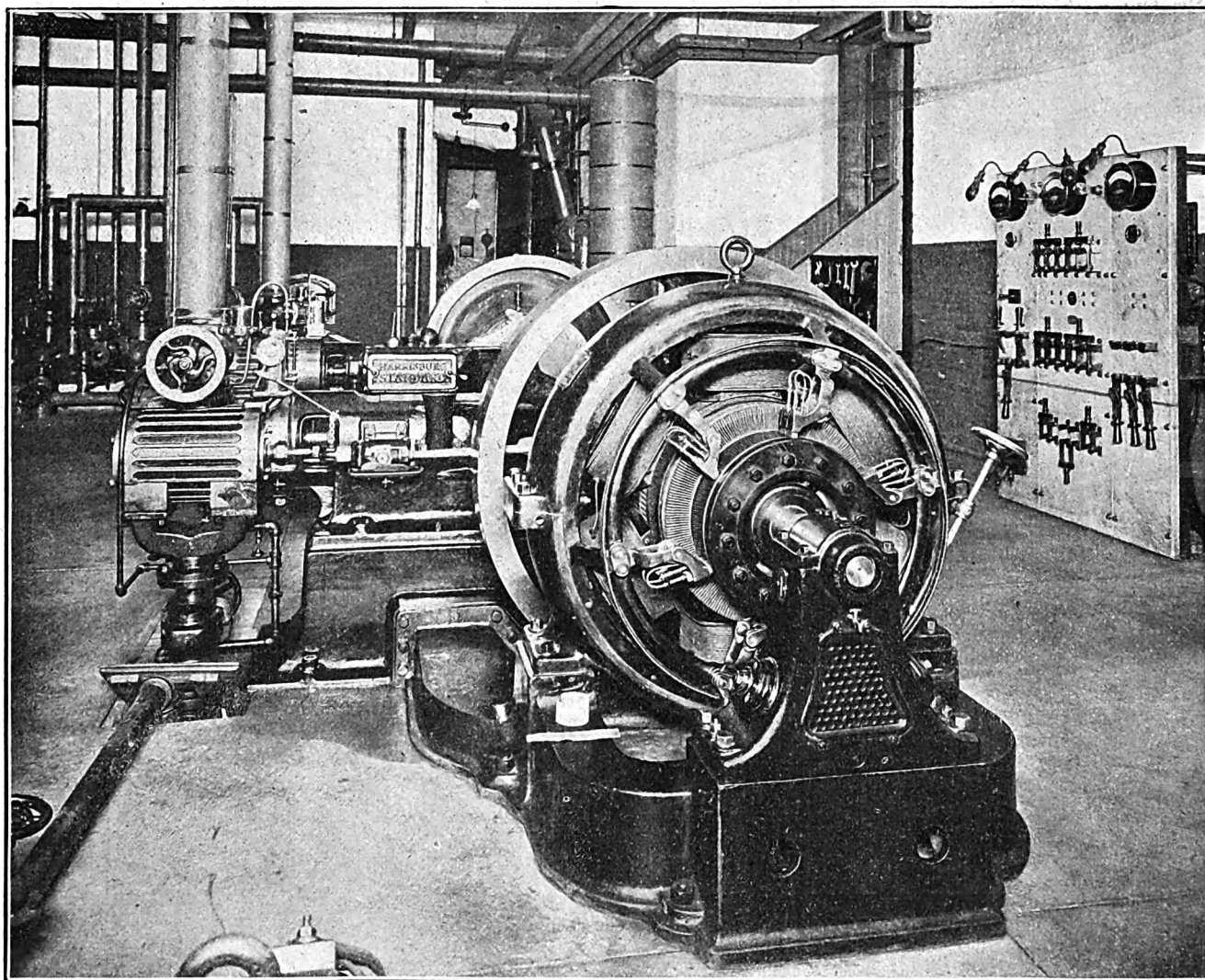
The two larger exchanges are equipped with elevator service, steam and electric plants, water filters and the usual fire protection devices. Th other buildings do

depreciating charges as compared with the three conductor switchboards.

The boards are highly finished, in excellent condition and are equipped with all the rapid service devices known to modern telephone science.

The electric power supply systems are ample and well arranged for connection with the city power service, so that interruption to business is a remote possibility.

The storage batteries are of the chloride type, are in



VIEW IN ONE OF THE ENGINE ROOMS, PHILADELPHIA EXCHANGE.

not require elevator service. The "Park" exchange building is supplied with an electric power plant, but the three smaller buildings take power from the city mains. All of the buildings are steam heated, the boilers being of the high pressure type, so that steam power may be used, if desired at any time, for driving generators, for charging batteries and for lighting of the building.

The switchboards are of the most modern pattern and have an ultimate capacity of 34,200 lines, 16,520 of which have already been installed.

The switching system is of the well-known two-conductor, multiple type, thereby simplifying physical conditions and very materially reducing maintenance and

excellent condition and ample for increased service.

The subway conduit system is of four-duct vitrified tile, laid on three-inch base of concrete and surrounded by three inches of concrete, thus insuring stability and protection from injury and surface leakage. This conduit system has been laid in the most thorough manner through over 274 miles of street and is reached by means of 6,105 manholes. The total duct feet is 11,648,439.

At the present time the company is using only about 15 per cent. of these conduits, allowing 10 per cent. for future use. There is still a reserve of 75 per cent., which can be rented for all kinds of electrical purposes.

An underground telephone system is so well protected from the elements and usual causes of trouble that

physical deterioration is practically eliminated, while maintenance charges are reduced to a minimum and the efficiency of service is enormously increased.

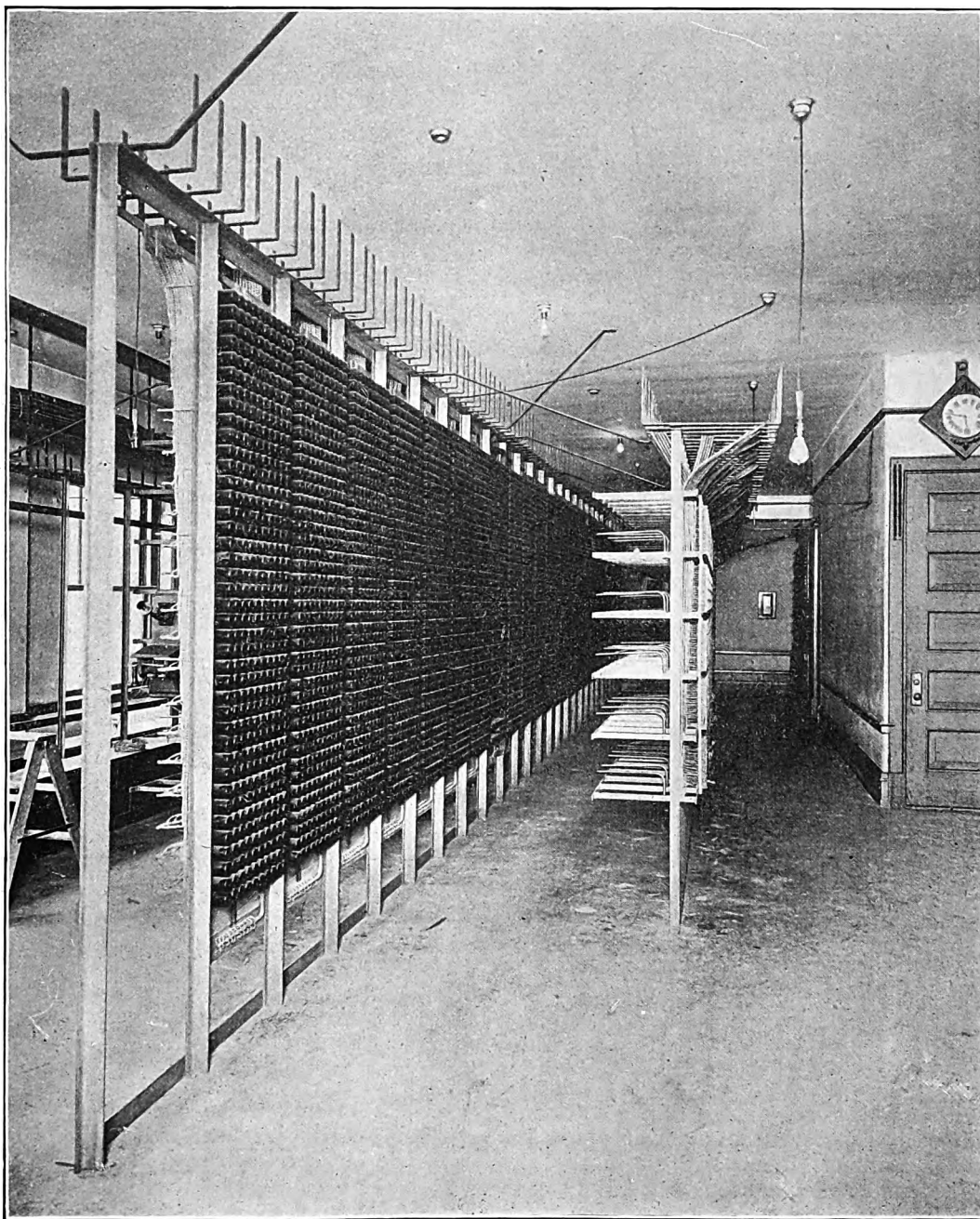
The advantage of such an ample and thoroughly installed conduit system in a large and growing metropolis are apparent to everyone and is a most important asset, which will increase in value and earning capacity as time goes on.

The Keystone Telephone Company of Philadelphia is operated under a perpetual charter from the state of

of twenty-two years' experience of others to guide it when it undertook to supply Philadelphia for the first time with telephonic facilities, such as other cities of far less importance have long enjoyed.

The ever-increasing daily business that the Keystone exchanges are doing proves that faith has been kept with the public and that the public knows it.

Taking the country as a whole, it would be difficult to find a good opening outside of several large eastern cities where Independent telephone enterprises have not



TERMINAL ROOM OF MAIN EXCHANGE, PHILADELPHIA

Pennsylvania, which covers all of the counties of Pennsylvania, and all of the states of the union, and also has a perpetual franchise from the city of Philadelphia.

There is not now, nor has there been from the beginning of its work in Philadelphia, anything experimental about the Keystone system. This company understood the scope of its problem and had the advantage

already occupied the field and become permanent profit-making corporations. Of the several cities of large population still but partially exploited, Philadelphia is now and will probably always be the most desirable. It is not much to claim that here the surface of the mine has been only scratched.

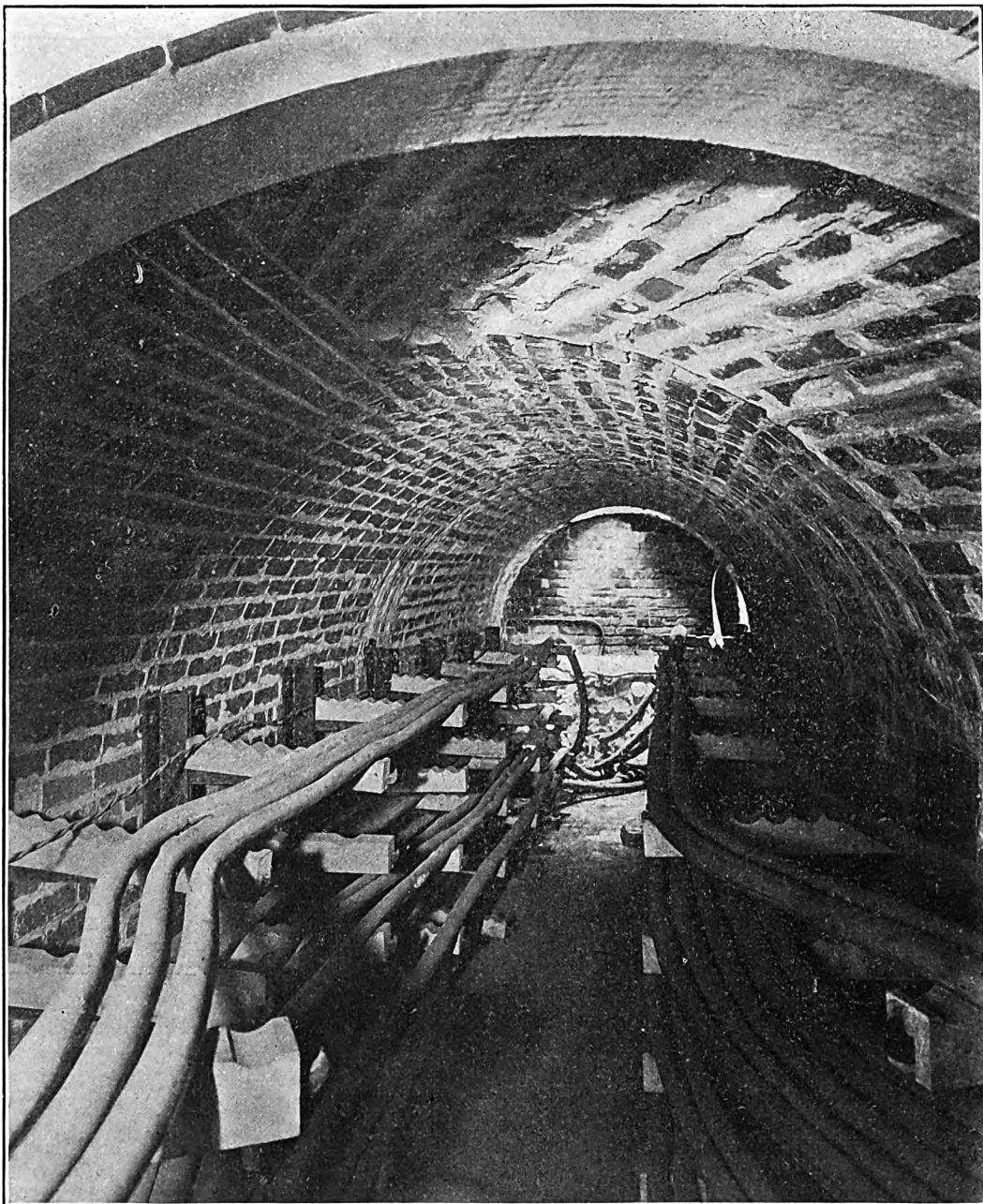


Philadelphia proper, surrounded by many fine suburbs and busy manufacturing districts, the center of a circle which includes scores of active tributary communities, all within instant call, is the ideal city for the rapid and profitable extension of such a system as that of the Keystone Telephone Company.

The agents of this company have found a public, already friendly in expectation of a relief from the unpopular service and general attitude of the old monopo-

public in favor of the clean, safe and durable conduit system, which cannot be interrupted by fires, storms or floods and which does not disfigure the highways or burden private roofs.

Changes in business methods in all retail lines will soon make it a matter of distinct economy for all householders, excepting, perhaps, the very poor, to have and learn to use the telephone in the same matter-of-course fashion that they now use gas, water and newspapers.



CABLE TUNNEL IN MAIN EXCHANGE, PHILADELPHIA.

listic company. This feeling grows, rather than diminishes, as the widespread use of the two systems has enabled the people to compare them.

Residential telephone service in Philadelphia now offers, and will long continue to offer, a vast field in itself. The pronounced antagonism of the extension into desirable neighborhoods of endless rows of heavy poles and networks of wires leads to the decided bias of the

It is all a matter of habit, and habit is the offspring of suggestion.

Through the establishment of the Evening Telegraph Information bureau by the Keystone Telephone Company any subscriber or any user of a phone may instantly have the very latest information regarding any current event of which the editors have knowledge, thus affording the public special news, often of the ut-

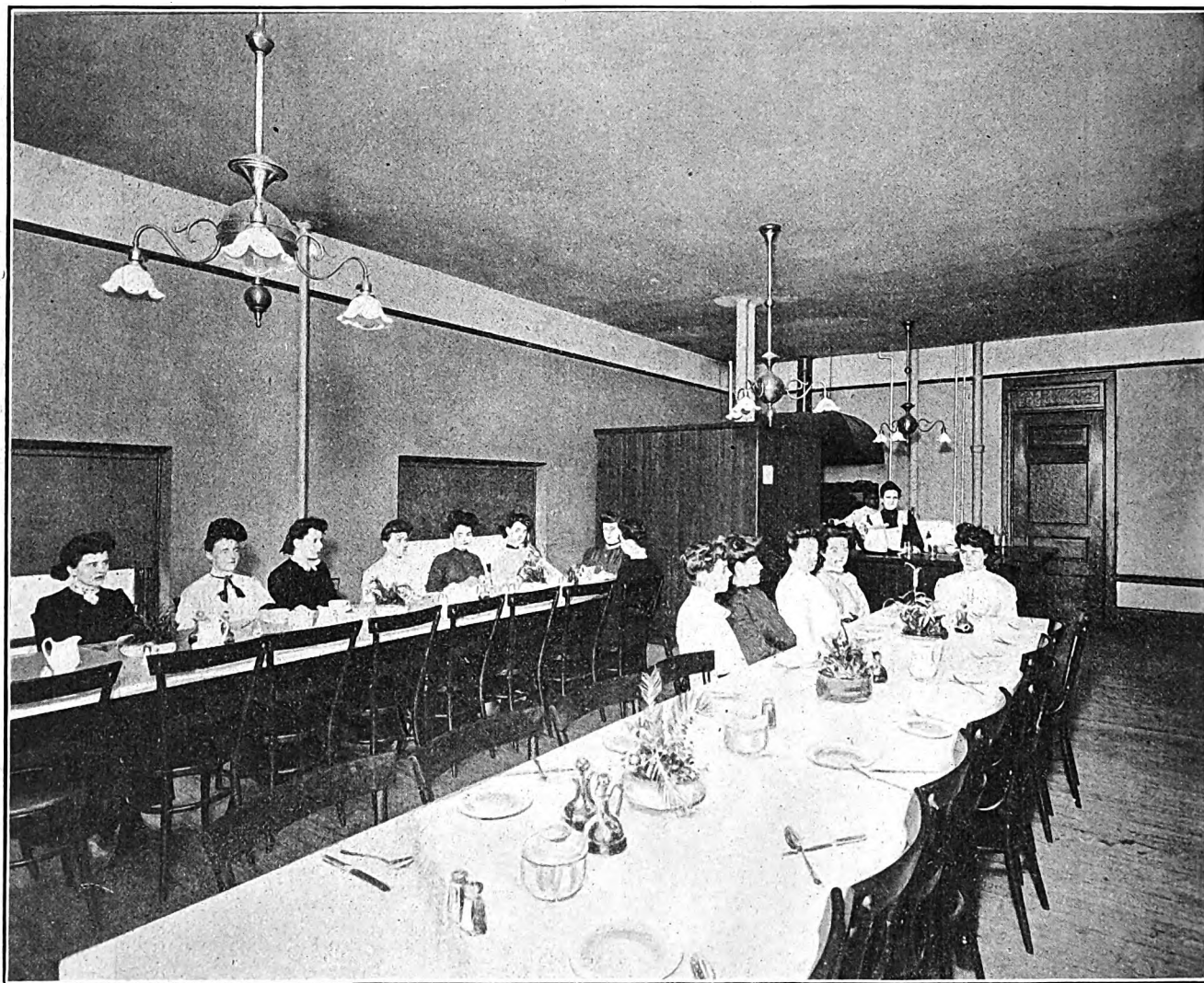


most importance, hours in advance of the issue of the papers. Through this means also the man who wants a situation may often be placed in touch with the man who has the situation to offer. In the case of lost or found articles the careless loser and the honest finder may "get together" without the trouble of advertising.

From the inquiry desk thousands of questions are answered every day, from giving a forgotten phone number to the location of the fire to which the engines are just being rushed.

certain its location, and the equipment force is dispatched at once to effect repairs or place phones in temporary offices. The men are often ready for this duty before owners or tenants arrive upon the scene.

In this connection it is interesting to note the increasing use of the telephone in sending alarms of fire, especially in suburban and residential sections. The subscriber or user of a pay phone simply keeps cool, calls up the Electrical bureau, either day or night, and reports the location of the fire. If it is of trifling character the bu-



OPERATORS DINING ROOM, PHILADELPHIA MAIN EXCHANGE

In the earlier days of telephoning it was the rule to compute the average time consumed in clearing "trouble" (the constant minor mishaps which result from storms, fires and other unavoidable causes) by hours or even days. Under the Keystone maintenance system all averages for such work are now computed by minutes. A special feature of quick work is seen in the rapid repair of telephone connections in the offices of subscribers where fires have occurred, and when, generally, the user needs the telephone to an unusual degree.

The Keystone Main exchange is apprised instantly of every fire occurring in the city. This information is imparted by the Electrical Bureau which also makes a test call at 6 A. M. and 12 o'clock noon daily. The operator at once calls up the phone nearest the fire, as-

reau dispatches a chemical engine to the scene, meanwhile keeping in touch with the phone first calling or another one near by, and notifying the fire department if further apparatus is necessary. This results in prompt fire service and a great saving annually to the city.

At recent elections many thousands of subscribers were furnished with the "returns" while sitting comfortably in their own homes, and quite as promptly as they were displayed to the waiting crowds upon the streets. Another innovation is the connection of the observatory upon the Washington meridian with a master clock at the main exchange which is in turn in connection with clocks at all other exchanges. By this means all subscribers may obtain the exact time upon inquiry.

All the stock of the Keystone State Telephone and

Telegraph Company is held by the Keystone Telephone Company.

This company was organized to operate in the territory adjacent to Philadelphia and to construct long distance lines to connect with the lines of other independent companies operating in this vicinity.

The company owns about forty municipal and township franchises, none of which contain any restrictions as to rates, etc.

It has been the policy of the company, instead of building a small exchange in each borough or town, to connect several of these small places to one exchange. The exchange in Jenkintown, Pennsylvania, for instance, supplies the service to Jenkintown, Elkins Park, Ogontz, Glenside, Weldon and Edge Hill. Another exchange supplies Conshohocken and adjacent territory. One exchange is located at Ambler, one at Willow Grove, and one at Darby, Pennsylvania.

The toll business of this company is growing very rapidly, it having increased nearly 100 per cent. in the last year. The company reaches through its own lines and connecting lines every important place in Eastern Pennsylvania, New Jersey, Southern New York, Delaware, Maryland and West Virginia.

The Keystone State Telephone and Telegraph Company also owns 40 per cent. interest in the Camden and Atlantic Telephone Company, operating long distance toll lines in New Jersey.

The Keystone Telephone Company has recently acquired the Eastern Telephone and Telegraph Company, operating in Camden and Gloucester counties, New Jersey, and the Telephone Company of South Jersey, operating in Cape May county. All of these properties are being improved and brought up to the Keystone standard.

In Philadelphia the Keystone Company has installed 365 miles of cable (not counting house cables). This is cable enough to install a four-pair cable between Philadelphia and Chicago. There are but 4 miles of aerial cable in use. At present there are in service: Stations, 22,000; pay stations, 3,100; private branch exchanges, 360; private branch trunks, 800; private branch stations, 4,200; junction boxes, 2,753.

### The Canadian Convention

The Canadian Independent Telephone Association will hold its annual meeting at the city hall in Toronto, Ont., on September 5. There will be present representatives from the numerous Canadian organizations in the different provinces, as well as from municipalities, which are also admitted to membership in the association. James B. Hoge, of Cleveland, O., president of the International Telephone Association, and J. A. Harney, assistant secretary of the same organization, two of the best known and most fully informed telephone men on this continent, have been invited and will address the convention on the telephone situation (especially the Independent movement, which has had such a marvelous growth, the Independent 'phones far exceeding all the Bells), and they will be ready to answer any questions in regard to organization, finance, etc.

As the Bell has begun its avowed defiant policy of non-intercourse and freezing out competition in New Brunswick, and has threatened the same policy in Quebec, and with a telephone war now begun in Ontario and Manitoba, the telephone question is going to be livelier than ever, and will be one of the predominating features of the coming year. In Canada to-day there are over

ninety absolutely Independent or non-Bell controlled telephone systems, with 4,000 Canadian shareholders, with over \$2,000,000 actually invested in them, and probably about 15,000 subscribers; the interests at stake are very important, and a struggle against monopoly is now on, which will, no doubt, end in a substantial victory for the Independents.

### Preserving Poles Pays

The value of pole preservatives has been fully demonstrated by the older telephone and telegraph companies and is rapidly coming into favor with the Independents who realize the value of permanent construction. Good construction is the watchword of all progressive companies, no matter what may be their size. It is a valuable asset that can be realized on as quickly in the pole line as in the switchboard. The main drawback to the general adoption of poles treated with preservative has been the expense. It, of course, is more or less costly to put timber through the various operations necessary to make it proof against decay; but if the process may be performed cheaply enough and if the life of the wood is sufficiently prolonged there is not the slightest doubt of the desirability of its preservation. By systematizing the process and the improvement of the apparatus it is now possible to treat timber so that it is well worth the while to use treated poles.

### Another Independent Victory.

The Cumberland Telephone & Telegraph Company (Bell) recently sued the Paducah (Ky.) Home Telephone Company, seeking to enjoin the latter from building an exchange at Mayfield, Ky. The Paducah Home Telephone Company won the suit and established its right to build at Mayfield. They are adding 5,000 lines to their American Electric Co. switchboard; installing new underground system; putting up 100,000 feet of new cable; and are building country lines. The company is a member of the Central Home Telephone Company of Louisville, Ky. The Paducah Home Telephone Company has a new manager in the person of H. J. Jeffery, formerly of Bedford, Ind., whose plant is also a branch of the Central Home Telephone Company. The Paducah company writes: "We are going to get the business, and we like your paper."

### Big Western Company

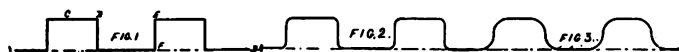
Elmer B. Jones, managing director and counsel of the Utah Independent Telephone Co., Salt Lake City, has organized the Montana Independent Telephone Co., with a capital of \$1,500,000, which is to cover the entire state of Montana. The new company expects to build to Butte, Helena, Great Falls and Anaconda this summer, permission to build to Butte and Anaconda having already been obtained. The Montana company will be an ally of the Utah Independent Company and the plan is to connect the two companies by good, substantial toll lines.

### Italy to Own Telephones

The minister of posts and telegraphs and telephones of the Italian government, acting under orders from parliament, is completing arrangements to have all new telephone systems in the country erected by the state and to take over the lines now operated by private companies. It is proposed to indemnify the companies owning the lines by means of a series of annual payments.

# Simultaneous Telegraphy and Telephony

Ever since the commercial utilization of the telephone there has been an effort to use the telephone circuits for telegraph purposes and the telegraph lines for telephoning. Telephone lines are so very expensive to construct when built for long distances that any extra earnings from using the circuits for telegraph purposes will help wonderfully to make a good income on the investment. From the beginning there has not been much difficulty in attaching the telegraph instruments to telephone lines, but when the telephone is to be used in connection with telegraph circuits the trouble is very great. Telephone companies are resigned to the necessity of metallic circuits, but it is almost impossible to get the grounded idea out of the head of a telegraph man. It is very desirable, if possible, to have telephone lines work

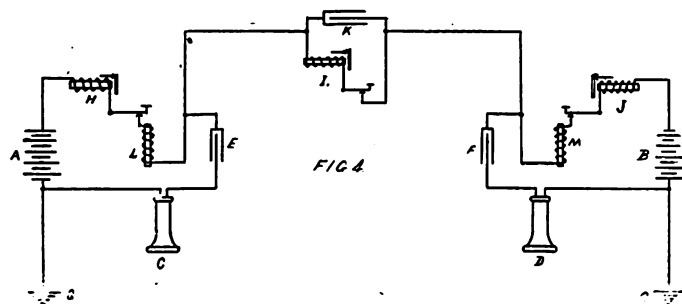


with a ground return but so far there is no way by which good results can be obtained over long distances. There would undoubtedly be a wonderful saving if such lines could be used and all noise and cross talk removed, but so far we are as far away from such results as ever.

It is quite easy to provide for simultaneous operation when there is but one telegraph line to each metallic telephone circuit, but the problem becomes more difficult when two circuits are desired upon which the telegraph is to be used and there is but one telephone circuit. This involves quite a considerable amount of carefully designed apparatus so as to permit the messages to be transmitted without any possible interference.

So far there has not been much call for this class of service among the independent companies because their toll line systems have not been sufficiently extensive. There are some of the companies that have been using telegraph instruments upon their circuits for many years with the greatest success. One company, it is reported, pays all its operating expenses from the telegraph business, leaving the telephone end net profit.

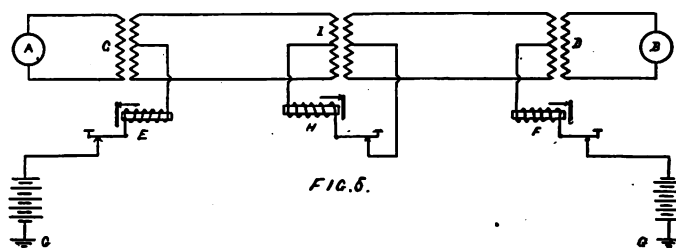
The principal difficulties to be encountered in the simultaneous transmission of both kinds of messages is



the avoiding of noises in the telephone instruments caused by the current that is operating the telegraph relays, and also the prevention of the telephone signalling currents from operating the relays of the telegraph end.

Whenever a telegraph key is pressed the battery current rises very quickly, so fast that if there should be a receiver in the circuit, there would be a very sharp sound heard in it. It can be seen therefore that the current must be changed in some manner so that the changes cannot be heard in the receivers on the line. It is a well-known fact that if the current passing through a re-

ceiver rises slowly enough and dies, and dies down at the same rate, there will be no sound heard. This is one of the things that must be accomplished before the composite system can be a success. It has been known for many years that if a coil of proper design is inserted in the circuit of an electric current, that upon the circuit being closed, the current would rise very slowly and, upon being broken, would die down equally slow. Unfortunately such a coil is extremely poor as a conductor of telephonic currents so some means must be devised for permitting the passage of the talking current. The condenser is happily just the apparatus necessary for permitting the passage of telephonic currents, and it presents an absolute bar to the passage of the telegraphic currents. There is then at hand the elements for the successful handling of telephone and telegraphic messages at the same time. If a current passes through any circuit in which there is no retardation or impedance coil, when the circuit is broken the current will fall to zero almost instantly, and when it is closed the current will rise to the full value in just as short a time. Figure 1 shows the diagram if the current, when there, makes and breaks as above explained. The current is shown by the line C, D and E. At D the current is broken and it immediately falls to zero as represented by the broken



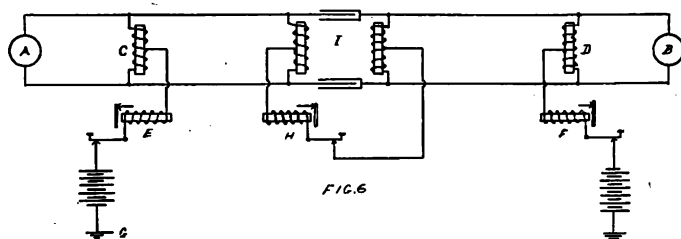
line A B. At F the current is again established and it rises instantly to full value again. With the relays in the telegraph circuit there would be a slight amount of retardation and the corners of the curve would not be quite sharp.

When a heavy-retardation coil is placed in the circuit, the reaction would be such that the current would rise quite slowly and then the curve would be something like that shown in figure 2. Here the corners are shown to be quite considerably rounded and there is quite a considerable time elapses before the current rises to the full value.

A condenser when properly placed in the circuit will help to still farther round the current curve, for during the first rush of current a portion goes to charge the condenser. The current then rises still slower in the line. When the current is broken the coil tends to help the current to preserve its value for a moment and the condenser assists by discharging into the line. Figure 3 shows approximately how the current is after the condenser is inserted into the current. With such a current there will be no sound heard in the receivers.

Figure 4 shows a circuit of a grounded telephone and telegraph line. This circuit will work over short distances not exceeding that over which a grounded telephone line will work. The telegraph circuit, we will say, starts at the battery, A, passes successively through the relay H, retardation coil L, relay I, coil M, relay J, battery B and through the ground G back to the battery A.

The two coils L and M prevent the current from rising too rapidly when the telegraph key is pressed and also prevent the too sudden fall when the current is broken. In talking on the circuit the great impedance of the coils L and M prevent the short circuiting of the telephone circuit. To prevent talking through the relay I the con-



denser is connected across its terminals. The talking current will readily pass through the condenser but not through the coils of the relay. The condensers E and F prevent the passage of the telegraphic current through the telephones C and D.

In figures 5 and 6 are shown two arrangements whereby one telegraphic circuit is possible with one metallic telephone circuit. In these circuits there is a notable lack of complicated apparatus and the arrangement is similar to the phantom talking circuit whereby it is possible to make one grounded telephone circuit from one metallic. In figure 5; C and D are two repeating coils. In figure 6 retardation coils take the place of the repeating coils. A and B in each figure represent the telephones, E, F and H are the telegraph instruments and G is the ground. In figure 5 the current from the battery passes through the telegraph relay E and then to the centre of the repeating coil secondary. Here the current divides and exactly half goes in each direction to the two sides of the metallic telephone line. At I is another repeating coil and telegraph instrument H. Here the current enters the primary of the repeating coil and comes out of the centre, from which it passes through the telegraph instrument H and thence to the centre of the secondary winding of the coil. The current again divides in half and passes over each side of the line to the coil D where it enters the secondary winding, comes out of the centre, and then passes through the telegraph instrument F and through the battery to ground. In this circuit there can be no difference of potential between the two sides of the line at any point and consequently there may be telephones any where along the line and they will not be disturbed by the telegraph current. Likewise the telephones may signal without disturbing the telegraph sounders. It is very essential that both sides of the telephone line shall be of the same resistance or there will be more current pass over one side than the other and there will be a disturbance to the talking. The repeating coils must be designed so that each half of the windings must have the same number of turns and the same resistance or there will be induction in the opposite windings caused by the telegraph current and there will be interference. The action of Figure 6 is almost exactly the same as that of figure 5, except that the arrangements for intermediate telegraph instruments are different. Two retardation coils are provided and are bridged across the line. Between these coils a condenser is inserted in each side of the line. The current then passes from each side of the line through the one coil to its centre, then through the telegraph instrument and to the centre of the other coil, where it separates in halves and again goes over the two

sides of the line. These coils must be designed so that each half has exactly the same number of turns and the same resistance.

Where no more than one telegraph circuit is needed, these last two arrangements will work very nicely and there is no need to go to the expense of elaborate apparatus for having two telegraph lines. It is only when the demand for telegraph service is great and it is necessary to utilize every possible plan to increase the earnings, that it becomes necessary to take steps to provide the double telegraph plan.

[TO BE CONCLUDED.]

### FINE FINANCIAL SHOWING.

The combined income for the calendar year 1905 of all companies directly or indirectly controlled by the United States Independent Telephone Company (exclusive of the Indianapolis companies) is as follows:

Income account of controlled properties:	
Gross earnings .....	\$ 4,155,505
Operating and general expenses .....	3,102,908
Net earnings .....	\$ 1,052,597
Other income (excluding interest and dividends from subsidiary companies) .....	188,482
Gross income .....	\$1,241,079
Deductions from income (excluding interest to affiliated cos.) .....	235,243
Net income before dividend .....	\$ 1,005,836
Position of company on basis of its interest in aforesaid net income:	
Company's proportion of the total combined net income as above, on the basis of its present direct or indirect holdings of stock, assuming such net income to be declared in dividends .....	\$ 943,580
Annual interest charge on the basis of the present outstanding bonds, viz., \$12,409,000 .....	620,450

Difference between the company's proportion of the combined net income of all subsidiary companies and the interest on its bonds now outstanding.....\$ 323,130  
 "Out of this figure it would be necessary for the company to provide for its administrative expenses, and the balance would be available for dividends or other purposes."

Balance Sheet, March 31, 1906:

#### ASSETS.

Cost of acquiring securities .....	\$56,459,343
Total company's own bonds and capital stock in treasury .....	29,824,000
Furniture and fixtures .....	134
Cash in banks and on hand .....	196,727
Cash to pay coupons .....	325,000
Cash subscription to bonds .....	1,685,000
	\$38,490,204

#### LIABILITIES.

Common stock authorized and outstanding .....	\$12,576,000
Deferred—authorized and issued .....	30,000,000
Total collateral trust bonds .....	17,000,000
Surplus arising from acquisition of company's own common and deferred stock .....	27,105,600
Bills payable .....	500,000
Interest on bonds—accrued .....	310,225
Contract of purchase—Utah securities .....	1,023,162
Profit and loss account .....	cr. 5,383
Total .....	\$88,490,204

x Includes securities (stock or stocks, bonds, etc.—Ed.) of the Stromberg-Carlson Telephone Manufacturing Co., Rochester Telephone Co., New York Independent Telephone Co., Utah Independent Telephone Co., and the Indianapolis Telephone companies.



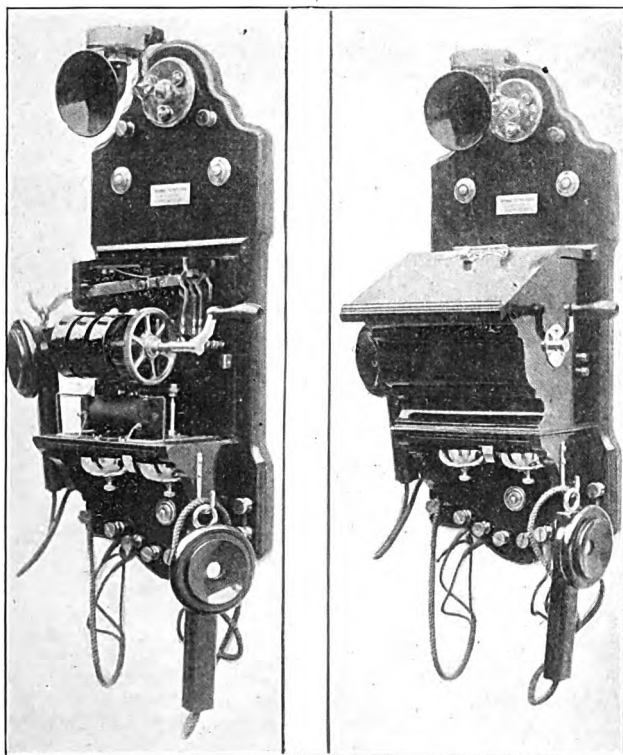
# Telephone Situation in Hungary

BELA GATI

Telephony forms at present a state monopoly in Hungary. Before this monopoly was created we had private corporations, but with such poor service that there was a general demand for state monopoly.

Now the state builds telephone exchanges and telephone lines and manages them with its post and telegraphic clerks. It is impossible to get permission to build and manage private telephone stations; for instance, the railroads have their telephone connections, the depots with the linemen's houses; the water companies; the fire

regard, the influence of the independent companies of the United States is very apparent. Hungarian engineers are sent out to study American methods. The results appear in their reports. Their opinion is that our rates are very high, for we pay in Hungarian crowns more than the "independent" American in dollars. The new

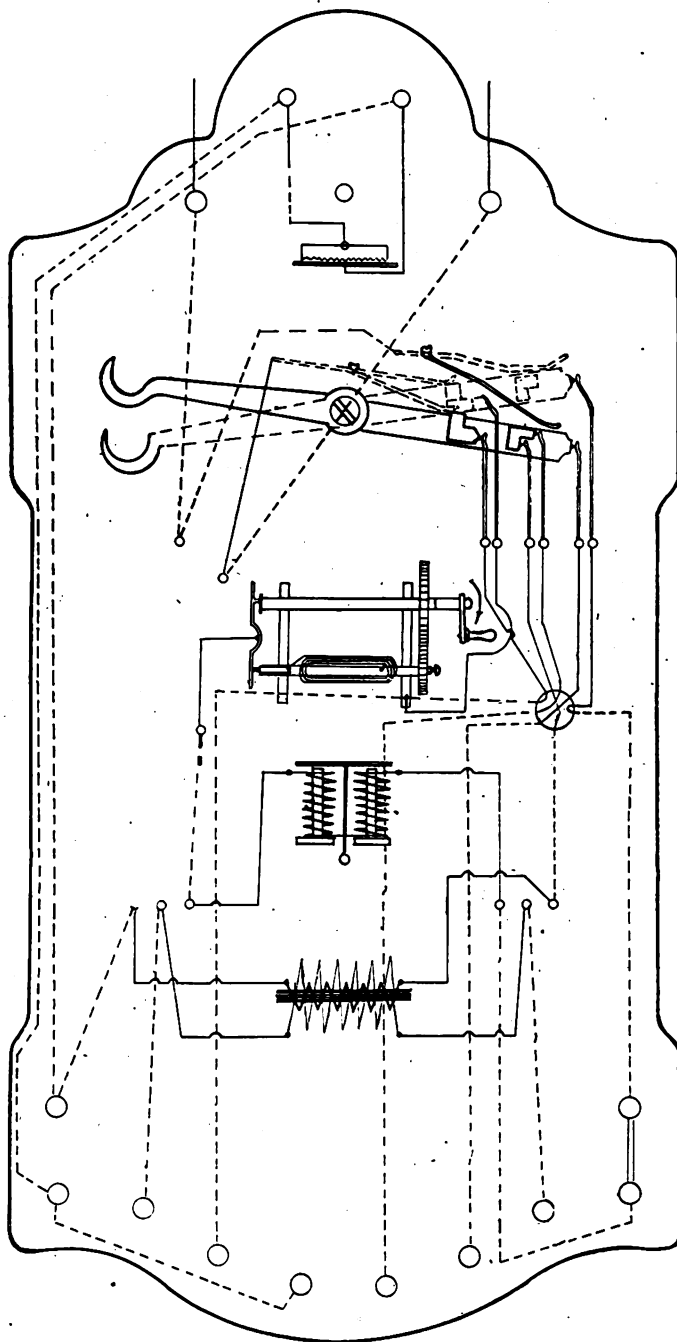


HUNGARIAN WALL APPARATUS

departments with their watchmen, and so on, but the people generally are not permitted to use these connections except in case of public danger, and they are worked only by the clerks of the said companies.

The development is not great with relation to the population, but there is also a difference in wealth between the United States and Hungary, in Hungary the people being about ten times poorer than in the United States.

In 1904 the population of Hungary was about 20,000,000; and we had 893 telephone exchanges, with 24,416 subscribers. Now we have more than 1,000 exchanges and more than 25,000 subscribers. On an average, the increase of exchanges is 110 and of apparatus 3,200 per year. In 1904 the length of the wires in cities was 60,000 miles, the connecting interurban lines, 40,000 miles, giving a total of 100,000 miles. The length of the toll-circuits is relatively great enough. The increase is very rapid, so that in a few years we shall have telephones in every city and village of Hungary. In this



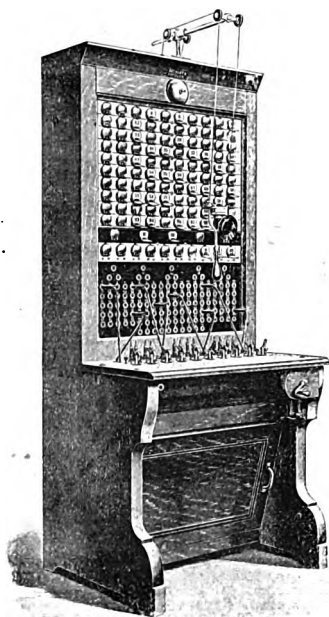
INSIDE CONNECTIONS

reform, already accepted by the minister of commerce, Mr. Kossuth, proposes much lower rates than those of today. The competition of independent companies in

America creates advantages not only in the United States, but also for the Hungarian people.

At present the capital of Hungary, the so-called American city, Budapest, has one of the largest exchanges in the world. There is accommodation for 40,000 subscribers; it has today about 10,000. We believe, however, that when the rates are lowered, the exchange will be too small.

In large cities the conductors are laid in cables; in smaller towns we have roof-consols. House proprietors are compelled to permit the installation of these roof-consols without charge. In this regard, the maintenance of these roof-consols is cheap and so the rates are lower. The rate is at present in Budapest \$60; in other cities, \$24 per year. There is no difference between business and residence rates. We have no party lines, and a very few automatic pay-stations. The latter are to be sup-



EXCHANGE FOR 100 SUBSCRIBERS

plied. In automatic pay-stations Hungary will have a large demand after a few months. The other telephone apparatus, receivers, microphones, exchanges, wires, cables, etc., are made by Hungarian factories.

The interurban lines are built with bronze wires, with 0.006-0.085 per cent. tin. The copper comes from the United States, the Japanese copper import having almost ceased, because the Russian-Japanese war interfered with delivery.

For making telephone apparatus we have three factories. Every factory manufactures also telegraph apparatus for other strong-current purposes. See the following table:

Name of Factory	Invested Capital	Number of Laborers	Total value manufactur'd per year	Telephone purposes percentages
United Electric Co. Egger and Co., Ujpest.	\$600,000	1,200	\$1,000,000	40 per cent.
Telephone Mfg. Co. Berliner and Co., Budapest.	\$260,000	160	\$100,000	70 per cent.
Deckert and Homolka, Budapest.	\$240,000	310	\$500,000	60 per cent.

The total manufactured value of telephone and other electrical apparatus is \$1,600,000 per year, and it is apparent therefore that the telephone industry is small enough and not by any means so flourishing as in the United States. The export is very little. Hungary does not compete with German apparatus, which is as cheap, as it is bad, especially for export.

I give now same details of apparatus used in Hungary. Fig. 1 represents the generator-call wall-apparatus open and closed. The terminals below are used for special purposes; night-ringer, second apparatus. We have always two receivers, which are always spoon-form. Fig. 2 is the general scheme of the inside connections. Fig. 3 is an exchange for 100 subscribers.

### The Situation in Chicago

The offer of President Wheeler, of the Chicago Telephone Company, to refund \$50 overcharge to users of unlimited service who will sign a waiver of claims for excess rates paid prior to January, 1902, is not meeting with much favor in official circles.

Assistant Corporation Counsel Maclay Hoyne, who has had charge of the telephone litigation for a year or more, warns subscribers that they are entitled to the repayment of \$50 a year since 1901 without any agreement because the company issued a circular offering to rebate the excess if the courts held \$175 was an illegal rate under the ordinance.

"This matter involves between \$1,200,000 and \$1,400,000," said Mr. Hoyne. "The amount of money to be paid back to subscribers may not exceed \$400,000, but there were between 6,000 and 7,000 subscribers at \$50 each who either gave bond to pay the excess or paid it in cash under protest or contract. These bonds will be annulled, which will relieve the signers of obligations amounting to \$50 a year."

The mayor said he had not had time to examine carefully the franchise proposition of the new Mercantile Telephone Company—a project of members of the Illinois Manufacturers' Association. This company proposed to furnish unlimited business service for \$90 a year a 'phone and \$60 a year for residence 'phones.

### An Inspector's Experience.

Telephone subscribers sometimes have ingenious methods of utilizing 'phones, and inspectors for the companies are kept correspondingly busy. Recently an inspector was sent to the home of a dentist, whose 'phone was out of order, and when the company's employe came upon the man he was drilling a tooth in a patient's mouth, and was using the current from the 'phone by means of a special contrivance as motive power for the drilling machine. Another instance that came to the attention of the inspector was in a West Philadelphia residence, where the 'phone was constantly getting out of order. The inspector believed that somebody in the house was tampering with the apparatus, but, although he tried to find out what was wrong, he was unsuccessful. One evening, when it was reported that the 'phone was again out of order, the inspector hurried to the house, brushed by the little girl who opened the door and went directly to the 'phone. Judge of the consternation he caused when he came upon the family, gathered about the receiver, and enjoying electric shocks through a contrivance connected with the wire.

# Standard Accounting Forms

To the Members of the Second Annual Convention of the National Inter-State Telephone Association:—Gentlemen:—Your committee on standard forms of Accounting, in submitting its report for your consideration, presents the following explanatory notes in a manner as brief as is consistent with clearness:

## GENERAL PLAN ADOPTED.

The classification is divided into six parts:

*FIRST*: Standard forms.

*SECOND*: Classification of income (receipts).

*THIRD*: Classification of construction (installation and equipment accounts).

*FOURTH*: General accounts.

*FIFTH*: Operating accounts.

*SIXTH*: Maintenance accounts.

The classification herewith submitted aims to show the number of accounts and so classify same that it will be feasible for the larger companies to use the classification as submitted, and equally possible, by a condensation of the accounts herein named, for the smaller companies to conform to and follow the lines laid down.

Your committee recognizes the fact that a classification of accounts can be arrived at by a committee of operating officers with as much intelligence, if not more, than is possible by a committee of accounting officers, and your committee believes the classification herewith submitted to be promulgated as much from the standpoint of the practical accountant, with, possibly, the added feature that in the classification herewith submitted your committee has gone a little farther than would the practical officer, in so far that your committee has considered a classification that would adapt itself to a simple and direct method of accounting as well as commend itself to the practical operating official.

Upon careful consideration your committee thought it wiser to confine the present report simply to a classification of accounts, and not to the standard forms covering same, with the single exception of the standard toll tickets, which will be treated at length later.

Your committee has also borne in mind the value and necessity of a classification that will be well adapted to meet the demands made upon it in the compiling and computation of statistics, such as costs and incomes per telephone per month.

In connection with the toll tickets to be used we recommend the adoption of the following, which is known as the HEWES SYSTEM OF TOLL ACCOUNTING:

There is no question but that the subject of "Telephone Toll Accounting" in all its details has received the least attention, as regards a uniform system or method, of any of the various accounts necessarily kept by a telephone company. The individual amount of money represented in each transaction is so small that there is a tendency to ignore those transactions which appear to be irregular or in error. For this reason, the persons handling toll accounts, realizing that there is no uniform cross reference method in vogue, to be used as a counter check against them, do not exercise the necessary care to be accurate. Knowing, oft times, that the amount of time, labor and postage required to check errors, involves a larger expense than the particular transaction in question represents, these small matters are ignored. At both ends of the line frequently this idea prevails. The absence of a cross reference method or system gives opportunity for dishonesty, or gross neglect in the records made by the operators. Whenever the cash is over it is allowed to accumulate until such a time as the cash runs short, and naturally

it is expected that one should offset the other, and the tendency is to forget that the "over" money belongs to the company.

The sending station operator devotes more attention to her "OUT" than to her "IN" messages, for she realizes her personal responsibility connected therewith. The receiving station operator is exceedingly careless in recording her "IN" messages, and heretofore has not been brought to task, when comparisons or checkings are made between the records of two stations, and her "IN" station has been found to record a less number of messages than the sending station shows to have been sent "OUT."

"Through" messages are often switched by exchanges, that do not own toll lines. Frequently, there being two or more routes by which a message may be sent to its destination, it is necessary that a "Through" ticket be used, which by its presence in the Clearing House will secure for the company over whose lines the message was routed, its pro rata of the 'haul,' also the switching fee for the company which did the switching (if any is charged), however nominal it may be. Any system which contemplates a "square deal" is commendable, and the system proposed is absolutely fair to all.

"Failed" or "lost" calls have been entirely ignored and a system which insures that the same amount of attention will be given to every call whether it is "cash," "charge," "deadhead," "failed or lost," is one which will assist in maintaining the proper discipline at both the sending and receiving stations. Each and every call being accounted for by a serial number on the toll ticket, compels the operator to give to each call proper attention. Inasmuch as each "failed or lost" call is a matter of record under this proposed system, the tendency is to reduce the number of such calls to a minimum. It is expected that the committee appointed for the purpose of defining "Standard operating rules and regulations" will cover this particular point, as there is probably no more important function performed by a toll line company in its routine business, that should be universally agreed upon, than the method of the recording and transmission of a toll line message. The rules governing the same should insure accuracy, and a concise and complete record of each call; a record of each of the individuals who do the talking at each end of the line; a record of the individual against whom the transaction is charged, and the name of the person who authorized the charge to be made (if against a firm or corporation); the time at which the conversation took place; and a separate charge for the overtime in excess of a three minutes conversation; the amount of the messenger fee, if any, and an opportunity for remarks in which to explain if the message was not O. K. and why. If the toll charges are reversed provision is made on the ticket to contain all the necessary information which will insure the prompt payment of the toll charges.

The importance and desirability of enabling each company which participates in the transmission of a toll message to secure its pro rata share of the toll earnings, is as important as it is that the transmission of the toll message should be paid for. Where several connecting companies endeavor to have their interchange business checked and prorated at one central point, viz: a Clearing House—it is indispensable that a standard form of ticket be used, not only as to size, shape and color, but the quality of paper, similarity of printed characters thereon, as well as permanency of the record. The necessity for a modern Clearing House has long existed and the pioneers in the field have been compelled to labor at a disadvantage for the reason that no standard forms to be used in toll accounting have yet been adopted. In considering the form of the ticket (i.e., the information which shall contain) we must consider, the requirements of the rural subscriber and also the metropolitan. One form must do for all, having in mind the bringing together each month at the Clearing House of all tickets for comparison. Each duplicate ticket should be a fac-simile of the original.

There are other advantages, one of which is the opportunity of having the ticket printed in large quantities which insures the lowest possible cost and if perchance a company's supply of tickets should become exhausted a neighboring company could help out in an emergency. The ticket should be as standard as the postage stamp and their method of use as thoroughly understood.

In the banking world of finance, each check representing a specific transaction is handled through the banking clearing

house, which each day settles transactions aggregating millions of dollars with absolute accuracy even to the penny. It must be conceded that a Telephone Clearing House provided with similar facilities, will likewise be enabled to accurately settle the interchanged business, prorating each telephone message. Each company over whose lines the message may have traveled whatever the number of miles, will be represented in the Clearing House by each toll ticket to have upon it the number of ticket from the other company with which it was placed in co-operation, thus making a complete record for its pro rata share of the message fee. Such briefly is the system that is recommended for consideration.

A deposit of drafts and cash at a banking institution, is checked by deposit slip. The receiving teller takes the drafts, checks and money with the deposit slip and immediately gives a receipt to the depositor for the aggregate amount, by entering in his pass book, the amount in question. In the event of any error appearing you thus have substantial evidence in your possession, likewise, it is important in sending your interchanged toll business (report and tickets) to the telephone Clearing House that you retain for yourself a copy of the report, and a copy of the tickets which represents every transaction. This duplicate ticket is provided by the original writing at the inception of the telephone message and is a fac-simile record of the transaction. These duplicate tickets are retained at the respective telephone exchanges and are filed in envelopes systematically arranged, as you would post the accounts of your toll subscribers, and are the means whereby you are enabled to make out your monthly statement. Each transaction may be immediately reproduced in all its details, in case of controversy with a subscriber or toll company. Each toll ticket being serially numbered and having the corresponding number of the other ticket with which it was placed in co-operation at the time the message was transmitted, enables you to easily check against the Clearing House if necessary.

Confusion is obviated, even if two or more messages are transmitted on the same date by the same parties. In the event of any discrepancies should it be found advisable to correspond with the respective telephone companies whose business is being cleared, it is only necessary to refer to the serial number printed on the ticket, that a comparison can be made and the discrepancy accounted for.

The distinguishing feature of this system of toll records is the exchange of check numbers between operators at the time of the message. The record of each call should be made before completing the connection. Failure to record any call through fancied lack of time because of other calls awaiting, is as inexcusable as it would be for a clerk, at a bargain counter to tell the proprietor that she was so busy handing out the goods that she could not take time to make out sale slips or take in the cash, as the reason for the existence of the store is to get the cash for its goods, so the main reason for the toll line connection is to get the cash or a perfect record of the service rendered. Therefore, no excuse whatever can be accepted, either from the sending or receiving operator for failure to record every call "IN" or "OUT" or "THROUGH" her station, except as may be provided by a specific rule.

Calls offered from stations of another company not using this system of toll tickets will be exempt from this rule relating to number of toll slips. Operators or managers are expected to bring to the notice of the Clearing House all notices of this kind with as little delay as possible, your operator must give such connecting company's operator the number of her ticket either "IN," "OUT" or "THROUGH," it being a receipt for the call.

A system of this sort will be of great assistance on very long hauls, where the calls are arranged by "MORSE" order wire through the use of duplex circuits, it being merely necessary, after the serial numbers have been exchanged between operators at different points, for one station to notify another that the call represented by a certain number is ready.

This system has been in successful operation since May, 1903, and was borne out of the experience along similar lines, in the sending, checking, and prorating of telegraph business.

## RELATIVE TO THE GENERAL PLAN ADOPTED WITH EXPLANATORY NOTES.

### FIRST.

**STANDARD FORM:**—The subject of Standard Forms is a very large and important one and the committee has not been able to give this matter the consideration to

which they deemed it entitled. It is a subject that should receive very careful attention and we should get consensus of opinion resulting from a broad discussion of the subject. Each particular form should be carefully considered and from many different view points. We therefore count it wiser to leave this question either to a subsequent committee or to further action of the same committee who have given considerable thought to the subject, or whatever may be the pleasure of the Association.

### SECOND.

**CLASSIFICATION OF INCOMES (RECEIPTS).**—1. Telephone rentals. 2. Long distance toll earnings. 3. Local toll earnings. 4. Pay station receipts. 5. Pole line earnings. 6. Conduit earnings. 7. Measured service excess calls. 8. Telegraph line earnings. 9. Private toll line earnings. 10. Sale of old material. 11. Miscellaneous income. 12. Interest on bank balance. 13. Messenger fees. 14. Dividends, and interest on stocks owned. 15. Any other earnings not covered by above.

### THIRD.

**CLASSIFICATION OF CONSTRUCTION (INSTALLATION AND EQUIPMENT ACCOUNTS):**—

(A) **POLE LINES:**—This account includes the cost of poles, cross arms, insulators, hardware and all sundry material, including also, the cost of setting and painting poles, freight, cartage, wages and cost of handling.

(B) **WIRES AND CABLES (AERIAL):**—This account to include the cost of all circuit wire, tie wire, drops, cable, cable hangers, sleeves, cable terminals, and all labor employed including freight and cartage, up to and including the house-bracket.

(C) **INTERIOR WIRING AND EQUIPMENT:**—To this account will be charged the cost of complete telephone instruments, house cable covered wire, office wire, inside fittings, junction boxes, lightning arrestors and all labor employed in installing same.

(D) **SUBWAYS:**—This account to include the cost of manholes, frames and covers, eye beams, conduits, cement, paving, lateral bends, lumber and all freight, cartage, labor and sundry materials used in the construction of sub-ways.

(E) **CABLE UNDERGROUND:**—This account to include the cost of cable and labor putting same in conduit, freight handling, tools, splicing, testing and connecting, including terminals, etc.

(F) **EXCHANGE EQUIPMENT:**—This account to include the cost of new switchboards, cable, cross connecting boards, storage batteries, charging machines, ringing machines, freight, drayage, and the labor of installing same. This account to be used when plant is enlarged or improved and in no case should be confused with repairs to exchange equipment under maintenance.

(G) **BOOTHES AND PAY STATIONS:**—This account to include the cost of all booths, coin boxes, signs and fixtures installed at central offices and pay stations, freight, drayage and labor employed.

(H) **PRIVATE BRANCH EXCHANGE:**—This account to include the cost of private exchange switchboard and the cost of installing complete; and the complete cost of inter-communicating systems, including labor, and all materials used, all interior wiring, and telephones installed in connection with private branch exchange switchboard to be charged to sub-division C under construction.



(I) SOLICITING:—To this account should be charged the salaries and expenses of solicitors engaged entirely on new work or extension of plant. If part of his time is engaged in maintaining old business that part should be charged to soliciting, operating.

(J) RIGHT OF WAY:—This account to include the cost of all rights and permits, exclusive of franchises, to construct, operate and maintain pole lines or other equipment along or over private or municipal property.

(K) FRANCHISE:—This account to include the cost of city or town franchises, granting the right to construct and operate telephone lines and systems and extensions of original property, including all expenses incidental thereto.

(L) TOLL LINES:—This account to include the cost of all circuit and pole lines, including labor, freight, hauling and sundry materials, erected strictly for toll purposes.

(M) REAL ESTATE AND BUILDINGS:—This account to include the cost of all real estate and buildings acquired in any manner.

(N) TOOL ACCOUNT:—To include the first cost of all new tools purchased.

(O) CONSTRUCTION SALARIES:—Charge this account all salaries applicable to construction work which cannot be distributed in the foregoing subdivisions. This refers particularly to a proportion of salaries of the general officers of the company.

(P) INTEREST AND DISCOUNT DURING CONSTRUCTION:—This account to include the interest paid on all loans effected for construction purposes, also the discounts on stocks, bonds or other securities used by the company and sold at a discount, for construction purposes. Any interest earned by the temporary lending of construction funds to be credited to this account.

(Q) LEGAL EXPENSES:—Including all law expenses in connection with organization, franchises, etc. These expenses must not be distributed through the various other accounts—such law expenses as may be incurred in connection with the purchase of rights of way and real estate may be charged to the account "Right of Way" or "Real Estate and Buildings," provided the expense is incurred only in connection with the purchase of some particular right of way, or piece of real estate.

(R) CONSTRUCTION EXPENSES:—Charge to this account all miscellaneous items of expense not directly covered by any other subdivision.

NOTE:—Further subdivisions of cost of construction may be made if deemed necessary.

#### FOURTH.

GENERAL ACCOUNTS—DEBITS:—1. Plant. 2. Accounts receivable, rentals, etc. 3. Unexpired insurance. 4. Unexpired directory. 5. Interest on bonds. 6. Treasury stock. 7. Treasury bonds. 8. General office expenses. 9. Freight and Cartage. 10. Bank accounts. 11. Stable expenses. 12. Warehouse supplies. 13. Furniture and fixtures. 14. Petty cash. 15. Rebates, cancellations, etc. 16. Officers and clerks salaries. 17. Collection expenses. 18. Soliciting expenses. 19. Taxes. 20. Insurance. 21. Light. 22. Heat. 23. Power. 24. Water. 25. Damage and accident. 26. Stationery and printing. 27. Postage. 28. Advertising. 29. Directory. 30. Traveling expenses. 31. Pole and right of way rental. 32. Interest and discount. 33. Rental of real estate and buildings. 34. Pay sta-

tion commissions. 35. Telegraph line earning commissions. 36. Long distance toll earning commissions. 37. Private toll line earning commissions.

GENERAL ACCOUNTS—CREDIT:—38. Capital stock. 39. Bonded indebtedness. 40. Unearned rentals. 41. Surplus. 42. Bills payable. 43. Accounts payable, vouchers, etc. 44. Accrued interest on bonds. 45. Accrued taxes, state, city and county. 46. Accrued tax on gross receipts. 47. Unclaimed wages.

#### FIFTH.

##### OPERATING ACCOUNTS:—

1. SALARIES AND WAGES, LOCAL EXCHANGES:—Operators, supervisors, monitors, attendants, etc.

2. SALARIES AND WAGES, LONG DISTANCE:—Toll operators, supervisors, monitors, attendants, etc.

3. PRINTING AND STATIONERY:—This account to include cost of all printing and stationery used in the operating departments for compiling records, monthly and daily reports.

4. POSTAGE:—Cost of all postage used.

5. LIGHT—EXCHANGE LIGHT:—This account to include a fair pro rata of total light bills which is considered applicable to operating according to existing conditions. Balance of light bills to be charged to the general expense account of light.

6. EXCHANGE HEAT:—Charge a fair pro rata of total heat bills which is considered applicable to operating according to existing conditions. Balance to be charged to the general expense account, "Heat."

7. EXCHANGE WATER:—Charge a fair pro rata of total water bills to this account as in the case of light and heat.

8. EXCHANGE POWER:—Charge entire power bill to this account.

9. EXCHANGE RENT:—Charge a proportionate amount of rent applicable to operating department.

10. EXCHANGE MISCELLANEOUS EXPENSE:—This account to include the cost of expense of dining room supplies, hospital, hospital supplies, medical services, traveling expenses, car fares, and other items incident to the operating department. In the event of meals being sold to operators or other employees, the proceeds to be credited to this account.

#### SIXTH.

MAINTENANCE ACCOUNTS:—(A) Repairs to pole lines. (B) Repairs to wires and cables aerial. (C) Interior wiring and equipment. (D) Repairs to subway. (E) Repairs to cable underground. (F) Repairs to exchange equipment. (G) Repairs to booths and pay stations. (H) Repairs to private branch exchange. (I) Repairs to toll lines. (J) Repairs to real estate and buildings.

All of the above accounts to include the cost of repairs to and replacements of materials, as listed under Construction, including freights and cartage and all cost of labor employed.

(K) SOLICITING:—To this account should be charged the salaries and expenses of solicitors engaged in maintaining old business.

(L) REPAIR TO TOOLS:—To this account should be charged the cost of all repairs to tools, or cost of tools purchased to take the place of tools destroyed or lost.

(M) MISCELLANEOUS EXPENSES:—To provide for all repairs not otherwise specified.

In conclusion, we wish to state that it cannot be expected by the members of this convention that a standard system of accounting can be formulated with the expectation that all companies will at once change their present method without a thorough investigation of the advantages of a new system. The general adoption of any uniform system of records will of necessity be effected only in time. We recommend that a permanent committee of at least five members be appointed to receive and consider suggestions from any or all of the Independent Telephone Companies, so that said committee can make such changes or enlarge the system as

may be deemed necessary from time to time, and also to act as an advisory board.

We also recommend the publication in pamphlet form by the Association, of this report in such a manner as will enable the larger and smaller companies to appropriate such particular features as are expedient to their needs.

Respectfully submitted,

Charles F. Bender, chairman, Pittsburgh, Pa.; Geo. T. Hewes, Des Moines, Iowa; W. H. Spooner, Minneapolis, Minn.; Charles West, Allentown, Pa.; J. B. Ware, Grand Rapids, Mich.; R. E. Mattison, Lincoln, Neb.; I. H. Thedieck, Sidney, Ohio.

## Telephone Stock Should Pay Dividends

J. H. M'CLUSKIN

In our article which appeared in the December issue, an attempt was made to point out briefly, the advantage of paying regular dividends to the stockholders of Independent Telephone Companies. It was shown that the use of borrowed money secured by first mortgage bonds, bearing a low rate of interest, is a very desirable plan of financing, and that new capital should be employed to meet the demands for extension of the service. It may be proper at this point, to enter into some explanation of the nature of a bond. A bond is merely the note of an individual or corporation payable to bearer (unless registered) and is secured by a mortgage which provides that the total amount may be cut up into small blocks of one or more denominations. Attached to the bonds are receipts for interest so numbered and dated that they may be presented at the office of the trustee at stated periods for payment and "no questions asked." The great difference between a bond and stock is that a bond is a lien on the assets and earnings of the corporation and its holder has first claim on everything, while a stockholder is a mere partner or part-owner in the business, deriving no profits therefrom until the bondholder's claim has been satisfied in full. The mortgage or deed of trust is usually drawn in favor of a banking institution or some prominent individual who is made trustee and clothed with considerable authority. The terms of the mortgage usually authorize the trustee to exercise a general oversight of the conduct of affairs of the corporation during the term of the mortgage. The trustee account for all monies received through the sale of the bonds; oftentimes, personally expending the funds, thus assuring the purchasers that the money is properly employed. He should be in close touch at all times with the condition of the corporation, and it is his duty to see that the interest of the bondholders is protected, and that all provisions of the deed of trust are fully complied with. It is the duty of the trustee to also certify to the correctness of the individual bonds and to attach to them his signature to that effect, thus preventing fraud. The deed of trust usually provides that in the event of default of interest payments, the trustee is to seek proper relief in the courts and have a receiver appointed for the purpose of winding up the affairs of the concern, either through a foreclosure sale or by operating the company under orders of the court until the claims of the bondholders can be satisfied. The trust deed or mortgage usually requires that

proper provision be made for the payment of the bonds at maturity. This is done either by providing that the trustee set aside a certain portion of the earnings from year to year, which sums, with the accumulated interest, will equal the face of the bonds when due, or by authorizing the trustee to call in certain number of bonds from time to time, thus gradually reducing the bonded indebtedness without imposing a grievous burden on the corporation. These are matters which are usually left with the trustee, and he is permitted to exercise his discretion in the discharge of his duties. One of the great advantages of a bond issue is that the directors of the corporation do not become personally liable for its debts. In other words, the corporation borrows money upon its own credit and not upon the personal endorsement of its management. Bonds are usually issued in denominations of \$1000 and \$500. The writer, however, believes it advantageous for telephone companies to issue their bonds in even smaller denominations. There are so many people who would buy a good bond if it were possible to do so, for \$100, but who cannot and never could buy one if they had to pay \$1000 for it. It is a mistake for telephone companies to assume that it is necessary for them to go to large cities to market their bonds. If the people in the community who are in close touch with the company's affairs and who have confidence in the ability and integrity of its officers, can not be induced to buy its bonds, there is but little hope of inducing the scrutinizing banker of the money center to purchase them. By issuing the bonds in denominations of \$100 and \$250, an attractive investment is thus afforded small tradesmen, who would buy the bonds through local pride if for no other reason. The bonds of small denominations usually reach the class of people who do not buy for speculation, but who buy them for investment only. A good example of this is the bonds of the St. Louis Brewing Association, which is composed of fourteen of the leading breweries in this city. The association has an issue outstanding of almost \$5,000,000 about \$4,000,000 of which are in \$1,000 denominations and the remainder in \$100 denominations. The last quotation on the Stock Exchange was 101 for the \$1,000 bonds and 101 for the \$100 bonds. A very few of the smaller denomination have been sold within the past two years, thus proving conclusively that the owners have put them away as an investment, while scarcely a day passes that quite a

number of bonds of the large denomination do not change hands. It is not necessary for us to say that the holder of the \$100 bond drinks the association's beer and brags on it because he feels that it is his beer, while the owner of the \$1000 bonds perhaps never saw the inside of a brewery. Bonds are looked upon with great favor by the capitalist and the small investor. For instance, a man having reached that period in life when he desires to retire from active business and having \$100,000 at his command, might loan that amount to some company and take his security in the form of a note covered by a mortgage. Suppose that at some future time he should wish to borrow \$10,000 using the paper of the company as collateral; it would be necessary for him to hypothecate the whole amount. On the other hand, suppose that he had taken bonds for security; he would then be able to make such disposition of his securities as he chose, as the bonds would be in the denominations of \$1000 or less, he could use as many of them as he desired and there would be no public record of the transaction. The small investor has learned that a bond of small denomination usually provides a safe investment for his earnings and can be quickly sold or hypothecated should he require ready cash. The fact that the bonds are made payable to bearer, does not necessitate any record of their transfer on the books of the company; hence, the identity of the holder is seldom revealed, thus assuring the privacy which so many persons of moderate means desire.

Bonds, for convenience, may be divided into three classes:—Public, semi-public, and private. Public bonds are those issued by the National Government, states and municipalities, semi-public bonds are those issued by corporations operating under special franchise, engaged in supplying the public with services, such as transportation, gas, telephone, water, etc. Private bonds are those issued by corporations engaged in mercantile pursuits, such as manufacturing, mining, etc. These latter concerns are subject to more or less competition and must depend upon their ability to sell their products in an open market. Bonds of the second class, because of the publicity given their transactions and on account of the absence of destructive competition, are usually more favorably regarded than are those of the ordinary business or manufacturing corporations. A company manufacturing shoes, for instance, must compete with many others in the same line of business, must buy its raw material in a fluctuating market and must sell its products at a price which makes the article attractive to the consumer, or, in other words, sell "at auction." A company supplying gas, for example, to a municipality, is not confronted with these conditions, as the rate at which its commodity is sold is usually prescribed for a stated period of years by the terms of the franchise; hence, if it exercises ordinary prudence in its management, it is assured of a steady income which will vary only in proportion to the patronage it is able to secure. We have dwelt at some length on this matter as the writer has discovered that a great many persons who are well informed on other subjects have but a vague idea as to the nature of a bond and its advantages. It may be proper to state here, that there is no sleight-of-hand work or ledgerdom necessarily connected with bond sales. In general, it may be said that a company which is not earning a creditable return on the amount invested, will have great difficulty in selling its bonds. It might be well for the information of the tele-

phone industry to state that there are a number of "financial institutions" that fill the columns of the Metropolitan Sunday papers with all sorts of alluring advertisements, boldly setting forth their ability to "finance meritorious propositions," "underwrite bond issues," "guarantee stocks, etc." One would think, upon reading their advertisements, that all that was necessary would be to visit their office with a scoop shovel and load up with dollars. These concerns have formed a sort of alliance, or "gentlemen's agreement," if you please, for their own mutual benefit and protection, often giving as references the names of other concerns engaged in a similar "business." They have been able to secure large payments of money for services in connection with the sale of bond-issues, the performance of which they have avoided by neatly worded contracts. While in Western New York recently, a prominent business man related his experience to the writer, which will serve to illustrate the general plan pursued by these "financial pirates." The gentleman stated that he was attracted by an advertisement in the Sunday edition of one of the New York dailies, and entered into correspondence with the "banking company," stating that he desired to raise several thousand dollars on his plant through a bond issue. In due time, he received the assurance that the money would be promptly supplied him upon the payment of a fee of \$1,500. For the purpose of closing the deal, he, in company with his attorney, visited the concern's office, in New York City, which was found to be sumptuously furnished with the most expensive furniture. While conversing with the "President" of the concern, the conversation was constantly interrupted by various stenographers rushing in to report the completion of Mr. A's deal or to advise him "that Mr. B's bonds were sold," or that "a check had just been forwarded to Mr. C. in payment for his plant," etc. Of course, this was all done to make the proper impression on the out-of-town victim. The head of the concern was then requested to furnish some references, and he glibly suggested that an inquiry be wired to the ——— Bank of Boston; a certified check was left attached to a contract pending the receipt of a wire from the Boston "Bank." The attorney who accompanied the gentleman was so impressed with the surroundings and the general impression he had received from the rush of "business," that he advised the gentleman to close the deal. In due time, a telegram was received from the Boston "Bank" that its relations with Mr. ——— "had always been pleasant, that his account was satisfactory, etc." But still the gentleman was not satisfied. Upon going to the office of a reputable New York bank, he discovered that there was no such "bank" in Boston. It is needless to say that the deal was not closed. Another form of fleecing the unwary is that of "underwriting bonds," which is worked very much on the same plan as the one pursued by the New York house mentioned above.

It may be stated as a general proposition, that the individual or concern that can sell corporation bonds, is one that enjoys the confidence of the investing public. The smooth-tongued individual who can, by his painting of glorious "word pictures" induce the unwary or ignorant to invest in mining or oil stock, is likely to prove a dismal failure as a bond broker. The intelligent investor desires to know first as to the safety of the principal. A company desiring a bond issue, must subject its affairs to the most rigid scrutiny in order to receive credit. A corporation desiring to borrow money from the public, i. e., place a bond issue, must fully satisfy the prospective purchasers

of its securities that its affairs are ably and economically managed; that its security is ample and that its earnings will enable it to meet the interest payments promptly and to liquidate the obligation at its maturity. In determining the ability of a corporation to meet these requirements, a record of its transactions, as revealed by its own books, is the only guide that the capitalist follows. The importance of proper accounting methods cannot be overestimated. In every branch of business, the old "book-keeping" is giving place to modern accounting. By this change, the men at the head of any given enterprise, derives from his books all the information needed for his intelligent direction.

The necessity for, and the value of, this change, arises from the modern increase of the amount of business transacted by a given establishment in the growing complexity of such business. Hence it is that such an intelligent and observing man of the world as Henry Clews, the New York banker, in a late address, laid stress on this subject in the following words: "But of the many improvements that might well be introduced into our commercial practice, the one of primary significance is the adoption of intelligent methods of accounting and auditing by all corporations or associations of persons which employ a considerable capital. The time has certainly arrived when the old and familiar systems of "bookkeeping" will no longer fittingly and advantageously answer for the conduct of modern financial business. It is now impossible for the manager of any large business to oversee in person its various operations and details. Results must be reduced to a scientific basis; they must be classified with the same minute care that a scientist would devote to the arrangement of a series of plants belonging to a new family or genus. This need for reform and for scientific method is not confined to any one group of institutions or any particular species of business enterprise. It is general, if not universal, need, resulting from the great growth of our activities, both in their scope and in the amount of capital they involve. \* \* \* The fact that many of our business men, even those who are leaders of thought in their own communities, continue to employ antiquated methods in the conduct of their business, and still depend upon out-of-date forms of statement, entails great danger to the credit basis of the community. And this danger is the greater because those who are the cause of it have no intention to deceive. Some, when they become involved, purposely resort to misleading methods of statement, or even willfully misrepresent the state of their affairs. But these are the exceptions. The truth is that this is more than a question of personal honesty and honor. It involves the commercial soundness of the community, and every effort should be employed to ascertain facts, and make sure that the statements submitted by applicants for credit certainly represent the state of the business to which they relate. Our practice has, in this regard, been far too lax; and a long step towards sounder conditions would be taken, were our bank managers to require the certification of the balance sheets of borrowers by competent public accountants. Such a plan is followed in European countries with most satisfactory results."

When a man goes to a bank to borrow money to enlarge or extend his business or to assist in the establishment of a new one, the banker inquires how the old enterprises under this man have been and are being conducted. If conducted prudently and economically, and in a manner leading to a safe margin of profit, new credit is given, otherwise not. It is the realization of these conditions

as described by Mr. Clews which has called into existence "auditing" companies, whose chief aim is to render a statement of a company's actual condition as revealed from an exhaustive examination of its accounts. This matter will be taken up and treated at some length in a future article.

### FRANCIS DAGGER, TELEPHONE EXPERT

Mr. Dagger is a native of Liverpool, England, and made his start with an ordinary high school education. At the age of sixteen he entered the service of the Lancashire & Cheshire Telephonic Exchange Company, where he spent some four years in gaining a most valuable experience, and filled successively the positions of electrician at Wigan and Blackburn, and wire chief at Burnley and Preston.

In 1885, he accepted a position at Bristol in the head office of the Western Counties and South Wales Tele-



FRANCIS DAGGER

phone Company, operating one-fourth of England and South Wales, where for four years he carried out important duties in connection with the general manager's department. The various matters dealt with by him in that connection included:

1. The purchasing of all construction material and supplies.
2. The making of estimates and the inspection and revision of all agents' estimates for the construction of local and long distance lines.
3. The inspection of all subscribers' contracts, and way-leave agreements before their acceptance by the company.
4. The conducting of correspondence relative to suspected infringements of patents, and making investigations in connection therewith.

During his stay in Bristol the company established forty-two exchanges and constructed 1,500 miles of long-distance lines. He had personally to deal with the estimates and purchase of material for this work.

In 1889, he was appointed manager of the South-west Devon and Cornwall District of the same company, being located at Plymouth, a position which he held until 1893, when he resigned, the company in the meantime having been absorbed by the National Telephone Company.

While at Plymouth Mr. Dagger was a prominent member of the Chamber of Commerce and in that con-



nection he established on Rame Head, a promontory on the Cornish coast, a signal station and connected it with the Plymouth exchange. This station is well known to trans-Atlantic passengers, as the approach of all steamers is at once reported by telephone and much time is thereby saved in the landing of passengers and mails; in fact, it was not until the establishment of this station was affected that Plymouth was made a port of call for American mail steamers.

In January, 1893, Mr. Dagger resigned and endeavored to promote Independent competing systems at Plymouth and Norwich, but was blocked in this effort by the action of the postmaster general, in limiting the granting of telephone licenses to municipalities.

In 1904 he re-entered the service of the National Telephone Company at Birmingham, where he was in charge of the electrical and maintenance department, under the title of chief electrical inspector. His work covered the towns of Birmingham, West Bromwich, Smethwick, Oldbury, etc., ten exchanges in all.

In 1896 he changed to a similar position at Sheffield, where he had the supervision of the towns of Sheffield, Barnsley, Worksop, Retford, etc. He continued with this company until July, 1899, when he was attracted to Canadian fields, where he saw an opportunity to carry out his earlier ideas with regard to the promotion of Independent telephony.

In August, 1900, he went to Toronto to take part in the agitation to bring about municipal ownership of the telephone service in that city. In this work he was associated with Alderman Urquhart, afterwards mayor of the city for three consecutive years, Mr. Dagger doing the work of consulting engineer. Their plans, however, did not materialize successfully owing to the refusal of the council to provide funds for canvassing, etc. He has since been identified with several Independent telephone propositions in Canada, and has always been ardent and active advocate of telephone competition.

Mr. Dagger is possessed of considerable literary ability and was for some time editor of the *Canadian Engineer*. His articles on telephone matters in that and other publications have done much to educate the public mind to the benefits of Independent telephony, his writings having been quoted in parliamentary debates in the Dominion House of Commons and the Manitoba Legislative Assembly.

In 1903, at the request of William Mulock, then postmaster general of the Dominion of Canada, he prepared a report on telephone conditions in Canada and elsewhere. The report so impressed the postmaster general that, on finding general sentiment so strong against Bell methods, a select committee on telephone systems was appointed to conduct a further inquiry. The basis for this work was Mr. Dagger's former report, he being appointed technical adviser to the committee. The committee continued work through the 1905 session. Sir William Murdock resigned and was appointed chief justice of the Court of Equity of Ontario. It was anticipated that the committee would be re-appointed this year. Presumably Bell influence, coupled with the retirement of Sir William Mulock from the cabinet, prevented. Legislation, however, has been enacted as the result of the inquiry removing some of the disabilities in the way of Independent companies, the more important of which being the access to railway premises, the right of appeal to the Railway Commission in the event of the right of way being refused by municipality. The new law places all telephone companies, including the Bell, under the

regulation of the Railway Commission, whose function is to decide all disputed points.

The greatest good accomplished by the parliamentary inquiry has been the awakening of public sentiment all over the Dominion of Canada to the necessity of competition and the utility of the telephone. Public sentiment is overwhelmingly against the Bell from the Atlantic to the Pacific. This was brought about mainly through the publication of Bell methods and the refusal of the Bell to recognize the needs of the rural communities. Prohibitive terms have been offered necessitating the farmers establishing their own service. They were at once made the subject of an aggressive attack on the part of the Bell, following their usual United States tactics. One of the instances of interference with farmers' systems under Mr. Dagger's direct observation was the placing by some unknown person of a cross on a toll line at night. This was done by means of a 36 copper wire, which was invisible from the ground and which no farmer would have had in his possession, making it very evident that the work was done by a telephone man.

### Development of Independent Telephony in Mississippi

(Continued from July Number)

The desk is provided with monitor lamps as extensions of the pilot lamps on the main board. The desk is also provided with a listening-in-key for each equipped operator's position on the main board. This desk is also provided with private line to the toll board.

A toll and rural line board as shown herewith was installed, equipped with ten toll lines, complete operating appliances, etc. The toll position is provided with a four-party master key for ringing selectively local party line subscribers, direct from the toll board through the common battery; half of the toll to common cords are provided with supervisory lamps, operating the same as those of the main switchboard.

The toll line position cord circuits are equipped with individual indicating ringing keys for four-party selective signalling; that is, the common battery half of these cords have a four-party indicating ringing key for calling selectively any of the party line subscribers on the main switchboard. A regular ringing key is provided in the toll half of each toll to rural line cord circuit for signalling on a toll line, also a bridged listening key in all of the cord circuits of this position. The common battery or local half of each toll to rural cord circuit is provided with a supervisory lamp operating same as the supervisory lamps on the calling half of the local cords at the main switchboard. Each position of the toll board contains pilot call and pilot supervisory lamps and a common night alarm.

Order wire keys and circuits are also provided in the toll board, connecting with the main switchboard and the various desks.

The distributing boards are constructed of architectural iron, well braced and securely bolted to make them strong and rigid. They are built in sections of 100 lines each so that additions may be made in 100 line sections at any time, up to the full ultimate capacity of the exchange. The main distributing rack is provided with carbon block lightning arresters and Kaisling self-soldering heat coil protectors.

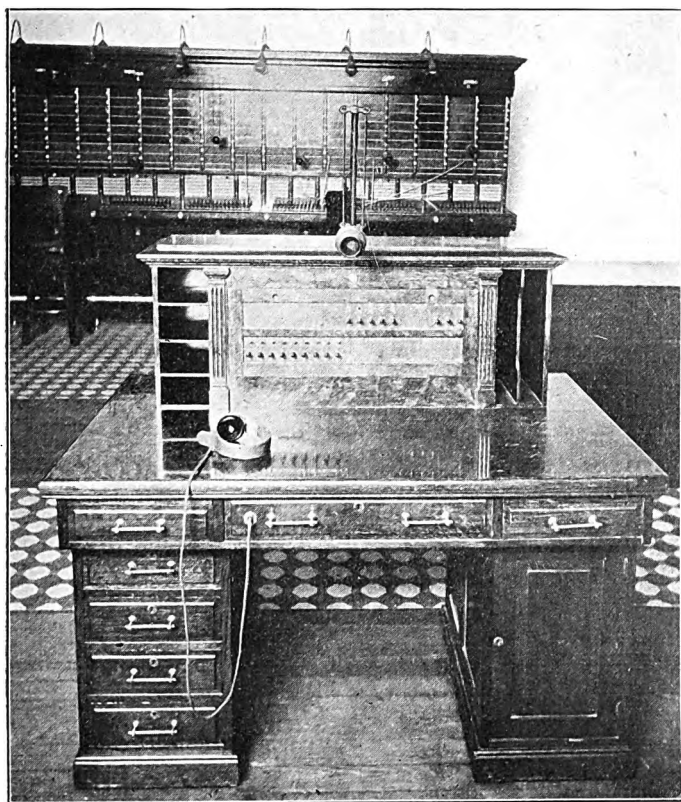
The distribution of the lines is done with flame-proof jumper wire. The switchboard cable work is of No. 22

double silk and cotton Runzel-Lenz switchboard cable and wire.

The line and cut-off relays are of the non-inductive tubular type, individually enclosed in a brass tube cap. The relays are mounted on a heavy architectural iron frame, provided with the proper fuses for the various leads, mounted on a marble slab at the lower end of each rack.

The power plant contains the necessary lead-lined tank chloride accumulator storage batteries in duplicate, each set consisting of twelve cells with a present capacity for meeting the maximum requirement of the original equipment of the exchange for a period of twenty-four hours.

There is a three and one-half horse power alternating motor directly connected to a three and one-half horse power dynamo; also a ringing generator consist-



TOLL BOARD

ing of a single phase one-half horse power motor, directly connected to a one-quarter horse power ringing machine, as well as an auxiliary ringing machine consisting of a one-quarter horse power motor generator. The machines are of the Roth Bros. type.

The storage batteries are set on racks provided for the purpose which are of neat design and strongly constructed. The power table for mounting the charging set and ringing dynamotors is strongly constructed and provided in front with a marble slab to correspond with the power switchboard.

The combined power and fuse board consists of a marble slab, mounted in an iron frame-work and contains the necessary switches, Weston volt-meters and ammeters, etc., with all the necessary apparatus to manipulate the various power circuits. This board is supported on an architectural iron frame.

The telephones used throughout the system are of the "International" well known central energy type, equipped with their bi-polar permanently adjusted receiver and their transmitter provided with their own make hard coal grain carbon.

With the class of line construction with which this plant is built and with "International" apparatus throughout, makes the exchange probably one of the best systems in the field and one in which the cost of maintenance will be at a minimum, requiring a small percentage allowance for depreciation, and make the securities of this company a far better investment than can be secured in almost any other line of business.

The company has also installed thirty-six of the Baird Manufacturing Company's lockout telephone among its lines, with the necessary central office equipment.

### Good Joke on the Bell.

George B. Shaw, manager of the People's Telephone Company at Exeter, N. H., had a plant that had been in use for 12 years. No repairs had been made on the lines and the phones and apparatus were in poor shape. Then came along some fellows, with money to burn—Bell money—who bought the plant for a good round sum. The money so received has been put into a new Independent plant, which is now being erected, and most of the old subscribers have signed contracts for 'phones on the new line. The new plant is to be central energy and cables will be used on all the streets. Exeter will have a first-class line, Independent throughout and built, it is supposed, with Bell money. And Mr. Shaw is wearing a smile that won't come off.

### A German Experiment.

All towns and landing places on the Rhine are soon to be connected by wireless telephone. Recent experiments at Cologne have demonstrated that the water makes an excellent conductor, even the slightest sounds and inflections being clearly heard. The sending apparatus is connected with the water through a large zinc slab immersed in the river and a copper wire, while the receiver's instrument is placed close to the water, which acts as the transmitting wire.

### Down With the Tyrant.

The manager of one of the Bell sub-exchanges in New York City has forbidden the girls to wear open work hosiery, peek-a-boo and Buster Brown waists. He—for the manager wears trousers and is not an old maid with side ringlets—is described as a small, dark, young man with a "hypertrophied sense of ultra propriety." We don't know what "hypertrophied" means, but it is quite formidable enough, we are sure, to fit the case. We have referred it to our physician, who says he doesn't think we are afflicted that way. Anyhow, the girls have our sympathy. Any mere man who would interfere with lovely woman's inalienable right to add to the beauties of this dull old world, and keep—herself—cool at one and the same time, should be ostracised or atrophied or hypotrophied or oslerized or blown up.

# Recent Telephone Patents

Z. B. BABBIET

**GUSTAF PAUL LAMBERT**, of Charlottenburg, Germany, telephone system with centrally-arranged microphone battery, Patent No. 824, 251, June 26, 1906. This invention has reference to a telephone system with a central battery, and it is chiefly intended to devise means whereby it is possible to ascertain in a simple and reliable manner whether the lines are busy.

**WILLIAM E. M'CORMICK**, of Chicago, Ill., assignor to International Telephone Manufacturing Co., of Chicago, Ill., telephone switchboard, Patent No. 824, 431, June 26, 1906.

This invention relates to telephone-switchboards, and more particularly to that class of switchboards wherein all the mechanical and electrical devices pertaining to each subscriber's line at the central station are included in a unitary structure capable of being placed in and removed from the switchboard as a single device.

**WILLIAM W. DEAN**, of Elyria, Ohio, assignor to the Dean Electric Company, of Elyria, Ohio, telephone-transmitter, Patent No. 823, 768, June 19, 1906.

This invention relates to telephone-transmitters, and more particularly to microphones in which granular or finely-divided material, such as powdered carbon, is used as the resistance-varying medium.

It has for its object the production of an instrument of this class in which the parts shall be easy to assemble and adjust without any sacrifice of accuracy or exactness and which shall be highly sensitive and efficient when assembled and adjusted.

**THOMAS J. MERRYMAN AND CARL L. ALLEN**, of Lincoln, Neb., telephone, Patent No. 823, 886, June 19, 1906.

The object of the invention is to provide a novel form of lighting attachments for use in connection with telephones and disposed in such relation thereto as to furnish an effective light in a prescribed zone and without discomfort to the user to enable him to consult the telephone-directory or otherwise employ the light in the use of the instrument.

**ERNEST A. FALLER** and Oscar Alvin Danielson, of New York, N. Y., automatic telephone-key, Patent No. 824, 291, June 26, 1906.

The present invention relates to telephone apparatus, and more particularly to certain circuit-closing devices or keys used in telephone systems now known in the art as "semi-automatic."

The present invention has for its object to eliminate the key necessary for opening a path for the admission of the selective impulses and to substitute therefor an automatic key arranged at the plug-socket of the connecting-pulley, which key is operated when the connecting-plug is removed or lifted from its socket and establishes the circuits over which group signals are received at the exchange-section.

In order to restore the contact-springs of the automatic key before the plug is returned to its socket, an electromagnet is provided, which in attracting its armature releases the contact-springs held by this armature and again opens the path over which the signals has been received.

**CLARENCE A. COOK**, of Chicago, Ill., assignor to Frank B. Cook, Chicago, Anchor. Patent No. 825, 587, July 10, 1906.

The principal features of this anchor are that by the use of the wrench the anchor is bored into the ground to the required depth, thus eliminating the necessity of digging a hole; that after the anchor is bored into the ground as far as desired, the extension plates are extended out into the solid earth by simply turning backwards on the wrench; and that there is no back play to the anchor when the guy wire is attached thereto and a strain put thereon. The extension plates when extended hold in the solid earth which has not been disturbed in the least. This gives a great holding power to the anchor as the holding surface is now double the surface of the auger as originally bored into the earth.

**BENJAMIN F. MERRITT**, of East Orange, N. J., assignor to New York Telephone Co., of New York, N. Y., Multiple-Switchboard Construction. Patent No. 826, 680, July 24, 1906.

The object of this invention is to more securely separate and individualize the different sections of the switchboard and guard against the spread of incipient fires which are always liable to be started at the cord-shelf connections, in the cabling, or in the branches or extensions which connect with the multiple jacks of the subscribers, or, in fact, in any part of the conductors or their connections. This is accomplished while at the same time securely supporting the several parts of the switchboard-frame.

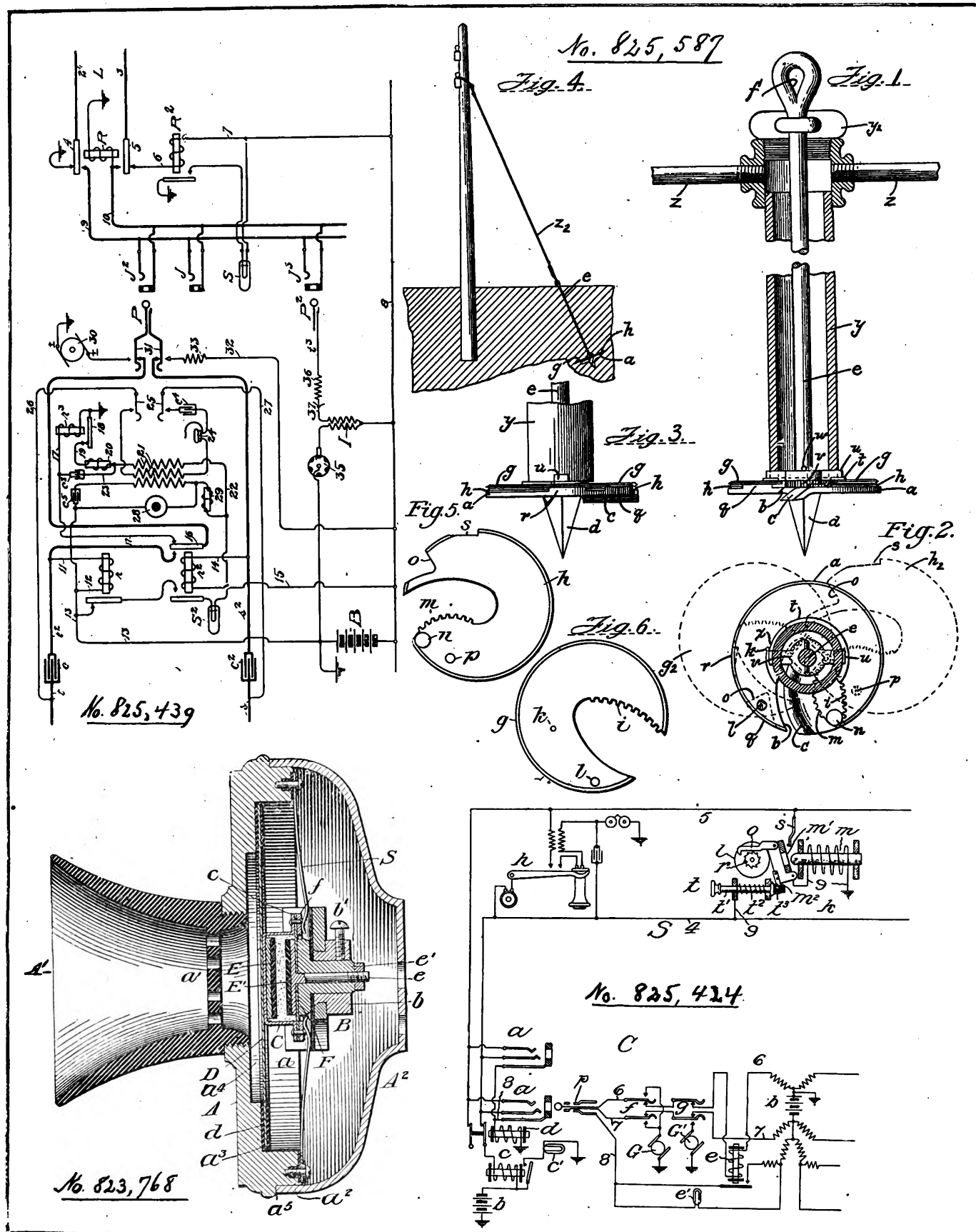
In the construction of multiple switchboards the wires are carried in cables horizontally from one section to another. The answering-jack cables may be placed in a compartment or space near the floor, and immediately above may be placed the repeating-coil-cable equipment, a connecting-rack being placed nearby, on which the repeating-coil cables terminate. The plates upon which the relays and resistance-coils are mounted may be arranged immediately above the connecting-rack and a space provided in front thereof and back of the rear side of the cord-space to accommodate the cables of the relays and connecting-rack, which cables are usually of silk and cotton covered wire. The cord-shelf is placed at the rear of the plug-shelf, which latter is directly behind the key-shelf. The subscribers' multiple switchboard cables are placed immediately back of the multiple jacks, which are on the upper portion of the board. The outgoing trunk multiple cables and the outgoing trunk multiple jacks are located in spaces provided above the cord shelf and below the subscribers multiple cables.

The invention relates to the manner of arranging these cables and cords and separating the same by bulkheads or partitions and at the same time providing for ready access to the different groups of cables and cords and their several connections. Bulkheads or partitions are arranged so as to divide the groups of skimmers belonging to a given section of switchboard from adjoining groups. It provides also a partition or roof above the cord-shelf of each section and divides the space below the cord-shelf of each section of switchboard from that of adjoining sections. These several partitions or bulkheads are made of non-inflammable materials of the requisite strength.

**CHARLES S. WINSTON**, of Chicago, Ill., special







Busy Test for telephone lines. Patent No. 825, 439, July 10, 1906.

This invention relates to improvements in apparatus to be used in connection with telephone systems, and

more particularly to apparatus to enable the operator to become informed of the condition of the telephone lines with which the subscribers desire to be connected for conversation.

The object of the invention is to provide a special busy test for the subscribers' lines, whereby when the operators perform the usual operations of testing the lines to determine their idle or busy condition the said test is made manifest to them and they are thus informed of the special condition of the line.

CHARLES E. SCRIBNER, of Jericho, Vt., Measured-Service System of Telephone-Exchanges, Patent No. 825,424, July 10, 1906.

This invention relates to measured-service telephone-exchange systems; and its object is in general to provide an improved organization of circuits and apparatus whereby a record may be made of each call from a subscriber's station which is answered and the desired connection established at the central office.

It consists of an electromagnet and an armature therefor, two branch circuits for said magnet, a switch adapted to connect the magnet with one branch, switch mechanism adapted in a partial attractive movement of said armature to transfer the connection of the magnet to the second branch, and means at a distant point for applying current to the first branch alone, or to both branches, whereby the extent of movement of said armature is determined.

EVERETT C. BREWER, of St. Louis, Mo., assignor of one-half to William H. Nolker, of St. Louis, Mo., Telephone-Transmitter, Patent No. 825, 635, July 10, 1906.

This invention relates to the provision of means in a telephone-transmitter whereby germ-laden moisture from the breath of diseased persons using a telephone may be prevented from lodging in the transmitter, the improvement consisting, essentially, in furnishing a seal for the exposed portion of the transmitter in front of the usual diaphragm and providing against the existence of any cavity in which germs may lodge and from which they cannot be readily removed.

CHARLES G. BURKE AND EDWARD J. BURKE, of Brooklyn, N. Y., assignors of one-half to

John Q. A. Whittemore, of Boston, Mass., Telephone System, Patent No. 826, 534, July 24, 1906.

This invention relates to telephone systems, and has, among other purposes, the providing of a means whereby direct battery-currents may be successfully employed for the transmission and reproduction of articulate speech over all lengths of telephone-circuits.

The invention primarily consists in introducing into a telephone-circuit a resistance additional to the ordinary variable resistance of the microphone transmitter, such additional resistance being capable of being varied by variations of the battery-current in the circuit of the transmitter and to a degree corresponding with the extent of such variations.

The invention also consists in providing a battery and a device for producing a counter electromotive force and so connecting them in a telephone-circuit as to improve the transmission.

The invention also consists in providing a battery connected to a main line and a device for producing a counter electromotive force connected in a shunt-circuit.

The invention also consists in providing a battery connected to a main line and an electrolytic cell connected in a shunt-circuit.

The invention also consists in providing a battery, a transmitter, and an electrolytic cell connected in a circuit, a telephone connected in a main-line circuit, the said main line being connected to the said circuit on each side of the said electrolytic cell.

The cut in the group shows the illustration of a new invention made by a Grand Rapids inventor. It is an arrangement for twisting wires and also for the winding of insulation on the lines after they are in position. There are many cases where it is necessary to attach insulation material after the wires are in position because of trees coming in contact. The arrangement may also be used for the twisting of wire and is supposed to save much time. This device is the invention of A. G. Champlin of Grand Rapids, Michigan.

## Talks and Queries

### Four Problems Solved.

EDITOR SOUND WAVES:—Please direct us on the following questions:

1. At what amperage does a solid back transmitter give the best results?
2. At what amperage should the batteries be discarded?
3. Will encasing ground wires in iron pipes for mechanical protection make any difference as to their carrying off lightning? We have been told that so encasing the ground wires would have the effect of a choke coil.
4. We are having lots of trouble with our heat coils. They do not operate as they should. We constantly find circuits open and upon testing find the trouble in the coil. The coil to all outward appearance is all right. Please advise us?

(1). The current required by the solid back transmitter varies considerably, depending upon who makes it. The old Bell local battery solid back transmitter was designed to work with .45 ampere normally. This was for long distance service, but all such transmitters in those days were supposed to be for that class of service.

If a transmitter is properly designed there does not

need to be that much current used, in truth better service can be secured with a consumption of not more than .2 ampere if the transmitter is made properly. With two cells of dry battery of the best grade, a modern transmitter of the solid back style will take about one-tenth of an ampere on an average.

(2). Discard your batteries when the service begins to decline. The amount of current at which to discard them is of course determined by the battery and the kind of transmitter. If the battery polarizes very rapidly so that the transmission is very poor after talking awhile the cell should be thrown out. It may be that at the beginning of the conversation the service was good and then after the battery ran down so that there would not be enough current to supply the transmitter. Such batteries would be apt to deceive you. In taking the reading of current, you should allow it to flow for a time till the amount is uniform and then take that as a standard.

When the transmitter takes about one-tenth ampere with two new cells, we would suggest that the current

discharge of about .04 ampere would be about the minimum. This current should be read with the battery discharging through the ammeter and the transmitter and induction coil.

(3). Run your ground wire through an iron pipe if you wish. Use a bare ground wire and make a good connection with the iron pipe at both ends of the pipe. There would not be any impedance in any case, but as lightning is inclined to take the surface of a conductor it might be well for you to have the pipe in the circuit.

(4). All heat coils will give the trouble that you describe once in a while. If lightning comes into office, it sometimes gets by the carbon blocks to the heat coils. The amount of current might be sufficient to burn off the heat coil wire but will not blow the coil because the time is so short that the coil does not have the time to operate. To lightning the coil presents a great impedance and it will jump to the body of the coil rather than to pass through. In jumping, the heat of the spark opens the circuit.

### As to Gravity Cells.

EDITOR SOUND WAVES—Some time ago I sent you a subscription to SOUND WAVES for one year and was to have as a premium Telephone Troubles and How to Find Them, but it has, up to date, failed to arrive. Please send at once.

I would like an answer to the following query: We have a switchboard for magneto lines. This switchboard is equipped with a hand generator which is for the ringing of country lines having as many as twenty instruments per line. We have about twenty town lines having series phones and about 155 bridging 1600 ohm phones.

The company sent with the switchboard three gravity cells to operate the board and two dry batteries for the night bell circuit. Our lineman has now increased the gravity cells to seven and thinks more would be better. Are more than three needed, and if so how many? What proportion of increase with increase of subscribers? Is it possible to get too strong a current and damage apparatus?

The premium was sent to you immediately after receiving the above inquiry. If it does not arrive within a reasonable time notify us.

The three gravity cells are all that are necessary. They are intended for the operator's transmitter and have nothing more to do with the rest of the apparatus than the batteries in a telephone. The reason that gravity batteries are used is that they are in use nearly all the time and must therefore be designed so that they will not run down rapidly on a closed circuit. If the three cells will not give good results they have not been well taken care of. Gravity cells require a great deal of attention if they are to be kept in good working order. The solution will evaporate and this makes it necessary to add water from time to time. As the action progresses, the solution in the top of the jar becomes more dense and the internal resistance also increases till a point is reached when but little current will flow. Every week a little of the top solution should be drawn off and then the cell should be filled up with water. The zinc should also be taken out and scrubbed about once a week. Do not let the crystals of blue vitriol entirely disappear from the bottom of the jar but put more in from time to time.

We have spoken of the upper liquid in the jar. If you will examine the liquid in the jar of a good gravity battery you will note that there are two different solutions, an upper and a lower. The lower is colored blue by the blue vitriol and the upper is colorless and is a solution of zinc sulphate. The blue vitriol solution is

heavier than the other and stays in the bottom, hence the name gravity battery. If the upper solution becomes too dense the dividing line will fall so low as to be in contact with the copper and a layer of zinc will be deposited on it. If the zinc sulphate solution is not dense enough, the dividing line will rise so high that the blue vitriol solution will touch the zinc and then copper will be deposited upon the zinc. Either of these extremes are bad so it is easy to see that the dividing line should be between the zinc and copper. So if you keep the battery in such shape you will not have much trouble. When the salts creep over the side of the jar it is a sure sign that the zinc sulphate is too dense.

These batteries will not hurt your transmitter if you had a hundred of them connected to it. Their internal resistance is naturally so high that even on a short circuit it would be difficult to get a flow of one ampere.

### Keeping the Hands Clean.

EDITOR SOUND WAVES:—Will you kindly tell me how to wash the blue vitriol solution from my hands. I am the operator of the switchboard and recently I have had to take care of the batteries for my transmitter. It is just ruining my hands and they are sore nearly all the time. I scrub them in soap till they are raw but it really seems that the more I wash the worse it sticks?

The solution of your problem is very easy when it is known (just like any other problem). The whole trouble is in using soap. The blue vitriol forms an insoluble compound with soap and that is why you cannot wash off the chemical when using soap. After your cleaning work on the batteries is over, grease your hands thoroughly with oil or vaseline, rubbing it in well. Then wipe off as much of the oil as possible and wash with the soap. You will find that your hands will be clean and soft. A pair of rubber gloves are nice if you feel like affording them. Then you do not have to bother with the washing of your hands.

### Long Telegraph Line

The Canadian Pacific railroad has run a special copper wire between Montreal and Winnipeg, a distance of 1,430 miles, touching only Fort William and North Bay, for its telegraph system, by means of which two messages—one by telephone and the other by telegraph—can be transmitted over the wire at the same time. A number of tests have been made at both Montreal and Winnipeg, and the operators at each end were able to converse with those at the other and in the meantime the operators at Fort William were sending a message by telegraph over the wire to Montreal, thus proving the success of the new system. It is claimed this is the greatest distance a human voice has ever been sent over such a circuit, but the Canadian Pacific railroad officials think the wire will work just as well at a still greater distance.

### Taking a Vacation

Orrin F. French resigned as general manager of the Cuyahoga Telephone Co., Cleveland, O., some time ago and is taking a long vacation at Ashtabula, O. He has under consideration flattering offers for his services from several companies.

# Personal and Field Notes

THE HAWKEYE TELEPHONE COMPANY, Indianola, Iowa, is enlarging its exchange.

CENTRALIA, WASH., is to have an independent telephone line under the management of F. B. Hubbard.

THE EMPORIA TELEPHONE COMPANY, Emporia, Kas., contemplates putting in the central energy system.

J. P. AIKENS has been appointed general manager and secretary of the new Eastern Perry T. and T. Company at Montgomery's Ferry, Pa.

THE ORDINANCE of the Illinois Manufacturers' association will come up for discussion when the Chicago City Council meets in September.

GENERAL MANAGER J. C. CASTER, of the Fort Worth (Tex.) Telephone Company, states that his company is about to expend \$150,000 in the improvement of its system.

THE BADGER TELEPHONE COMPANY, Oconomowoc, Wis., has commenced building lines to connect subscribers at Monterey, Ashippun, Toland and Stone Bank with the exchange at Mapleton.

GENERAL MANAGER M. PERDUE, of the Stark County Telephone Company, Alliance, Ohio, informs this journal that his company is at present spending \$6,000 in extending and improving its lines and service.

THE PAN AMERICAN TELEPHONE COMPANY, Ft. Smith, Ark., has been re-incorporated with a capital of \$500,000. Charles Sutter, of St. Louis, will be president. Building of extensions is to begin at once.

THE RUSSELLVILLE TELEPHONE COMPANY, Olean, Mo., has just been incorporated with a capital stock of \$3,600. A. F. Hoffman is secretary and treasurer of the company and P. P. Aperson manager.

THE CITY COUNCIL of Davenport, Iowa, has repealed the 2 per cent. franchise tax hitherto imposed upon the Union Electric T. & T. Co. The company proved to the city that the tax was burdensome and unjust.

THE CITIZENS' TELEPHONE COMPANY, Centerville, S. D., has been organized, with a capital of \$50,000. An exchange, rural lines and some toll lines will be erected at once. The general manager is J. A. Crane.

AT ITS RECENT ANNUAL MEETING the Northern Kansas Telephone association elected the following officers: C. L. Brown, Abilene, president; Dr. Tyler, Clifton, secretary; and W. W. Dilworth, Detroit, treasurer.

THE BOONVILLE TELEPHONE COMPANY, Boonville, Mo., of which H. M. Taliferro is secretary and manager, has increased its capital stock to \$50,000. Extensions and improvements are planned in all directions.

THE PEOPLE'S T. AND T. COMPANY, Knoxville, Tenn., of which J. C. Duncan is president and general manager, is going forward with improvements and additions and rapidly building up one of the finest exchanges in the South.

THE ANNUAL MEETING of the Pennsylvania State Independent Telephone association will be held at Allentown on September 11 and 12. This journal has made arrangements to secure a full report of the proceedings of the meeting.

THE INTERSTATE T. AND T. CO., Austin, Minn., recently has built 50 miles of pole lines in rural districts and added 3,000 feet of cable to 75 miles of wire to take care of increasing business. Further extensions are now in progress.

THE MANAGERS of the Independent telephone companies of Indian Territory met at Wynnewood recently to consider the

improvement of the service. Some timely remarks were made by E. L. Spencer, manager of the Spencer Telephone Company.

THE MILLSTADT TELEPHONE COMPANY, Millstadt, Ill., has reorganized, with George Sauthoff as president and A. C. Kern as secretary. Mr. Kern gives much of his time to the company's work and is determined to make the exchange a success.

THE UNITED TELEPHONE COMPANY, Monroe, Wis., of which C. W. Twining is president and P. J. Weirich general superintendent, now operates and owns 305 telephones and several farmer line systems and toll lines. Its capital stock is \$25,000.

GENERAL MANAGER F. E. EVERSOLE, of the Lincoln (Neb.) Telephone Company, has resigned his position to enter construction work in the east. He will be succeeded by Leonard Hutz, at present city electrician of Lincoln. The change will take effect January 1.

MUNICIPAL TELEPHONY is making rapid strides in Canada. Fort William, Ont., has 755 municipal phones, as against 150 Bell phones. Port Arthur, Ont., comes next, with 733 municipal and 73 Bell phones. Neepawa, Man., has 197 municipal and 29 Bell phones.

THE HOME TELEPHONE COMPANY, Alameda, Cal. has received a hard blow from the city trustees who refused to pass its franchise ordinance. The Sunset Bell Company prevented the passage of the measure by enlarging upon the "inconvenience" of a double telephone system.

THE MUTUAL TELEPHONE COMPANY, Sioux Center, Iowa, has just completed the building of a modern exchange, costing \$2,500, under the direction of F. H. Stacey. The farmers all around the town are building lines to connect with the exchange and the Bell is likely to lose 16 farm lines.

THE CITIZENS' TELEPHONE COMPANY, Grand Rapids, Mich., is spending just now the handsome sum of \$22,000 installing conduit and new cable to take care of the growth of its business in the southeastern part of the city. One thousand additional automatic switches are being installed.

THE INDEPENDENT TELEPHONE COMPANY, Kankakee, Ill., has recently elected the following officers: President, Wm. Fraser; vice president, Joseph Speicher; secretary, J. E. Sherwood; treasurer, Thos. Legris. The company, which was organized in 1903, now operates 1,800 phones.

THE SHELBY COUNTY TELEPHONE COMPANY, Shelbyville, Ky., is making arrangements to build a number of lines within the state of Kentucky. It has an authorized capital of \$200,000 and was incorporated by E. A. Barnes, J. M. Payne, Berkley Minor and other residents of Charleston, W. Va.

A. J. VERNIER, the pushing manager of the Eastern Telephone and Telegraph Company, Kankakee, Ill., states that his company will construct a toll line from Chebanse to Gilman, Ill., passing through Clifton, Ashkum and Sanford and will also install 5,000 to 6,000 feet of cable in Kankakee within the next 60 days.

THE WINONA TELEPHONE COMPANY, Winona, Ind., has lately built a toll line from Winamac to connect with Laporte City, a distance of 45 miles. Also a new line from Winamac to Medaryville, and is now building an exchange in Monterey. The latter is the sixth exchange built or remodeled since 1903.

FARMERS at Rock Island, west of Spokane, Wash., are organizing a mutual company to run a telephone line from that city to Wenatchee and to Badger Mountain, connecting also with Waterville, giving it connection with every town in the



Wenatchee valley. It is purposed to extend the line into the Big Bend country before the end of the year.

**THE MONMOUTH TELEPHONE COMPANY**, Monmouth, Ill., shows a gain of 181 phones during the past year, showing a total of 1,002 in the city and 315 in the county. C. C. McClung was re-elected president at the recent annual meeting and W. J. McQuiston will continue to be secretary. The company, for the first time in its history, is entirely out of debt.

**THEODORE GARY**, Macon, Mo., has lately become associated with Mr. Pankey in the Topeka (Kas.) exchange and is deeply interested in the reconstruction of the plant. Mr. Pankey will, however, continue to be president and manager of the company. The new deal places Mr. Gary, who has been part owner and manager of the Atchison exchange for several years, in a commanding position in the Kansas Independent field.

**REPRESENTATIVES** of the independent telephone companies in North Carolina met at Greensboro recently and formed an organization for better competition with the Bell company. Some 25,000 telephones were represented at the conference. W. A. Wynne, of Raleigh, was chosen president of the organization, and W. B. Leavitt, of Southern Pines, secretary and treasurer.

**MR. AND MRS. ALONZO WHEELER**, Des Plaines, Ill., announce the marriage of their daughter Grace to Mr. Walter Trimm, on August 1. Mr. Trimm is sales manager for the Monarch Telephone Manufacturing Co., of Chicago, in which responsible position he has won the esteem of hundreds of patrons, to say nothing of the friendship of his associates, who join in extending cordial congratulations to him and best wishes to the charming bride.

**GENERAL MANAGER R. E. HAYNES**, of the Independent Long Distance Telephone company, Boise, Idaho, says that the company is now occupying its new building at Payette. On September 1 the company will take possession of its new \$20,000 building, with a \$20,000 Stromberg board, at Boise. An additional section of board has been installed at Caldwell, and an exchange has been installed at Emmett. The plant at Boise is one of the best in the west.

**THE DETROIT TELEPHONE COMPANY** has underwritten \$3,000,000 of its bonds with a 40 per cent. bonus of stock, with the Commonwealth Trust Co., of St. Louis. The work of construction is now actually started and the plant is expected to be completed by October 1st, 1907. The company has already obtained 5,500 signed contracts and expects to start operations with over 10,000 telephones.

**THE OVERLAND TELEPHONE COMPANY**, an organization of farmers and ranchmen, with headquarters at Harriburg, Neb., has completed 70 miles of telephone line and are now working on the last 40 miles of line at the present time. Several more miles will be added this fall. When completed Banner county will have over 225 miles of independent telephone lines. F. O. Baker is the manager of the company.

**THE FIFTH DISTRICT** of the Nebraska Independent Telephone Association was organized recently at Beatrice. The district comprises Thayer, Jefferson, Pawnee, Richardson, Johnson, Nemaha and Gage counties. There are 40 Independent companies in this territory, with an aggregate capital of \$2,000,000 and 17,000 subscribers. The following officers were elected: President, C. W. Bartlett, Fairbury; vice president, A. R. Morris, Blue Springs; secretary-treasurer, C. W. Pool, Tecumseh.

**PROF. S. H. SAUVE**, of Spokane, Wash., has perfected an electrical device, which, he declares, will greatly increase the efficiency of long distance lines and will apply wherever induction coils are used. He struck upon the plan while experimenting with a coil in which one wire was broken. He uses three wires in the new coil and he says this increases the efficiency by 40 per cent. He has been placed at the head of a company having a capital of \$750,000 and a plant will be established in Spokane the coming fall. The device is protected by patents in the United States and foreign countries.

**NEW YORK** is in the midst of an interesting telephone franchise fight. The company which now has a monopoly offers \$3,500,000, to be paid in installments annually within

twenty-five years, if left in exclusive possession of the field. Its opponent offers \$2,680,000 for a twenty-five-year franchise, with an option to the city to purchase at that time. In addition it offers exceptional advantages in the matter of rates, and agrees to limit its net earnings to 10 per cent. on its actual investment after taking care of depreciation. The chances are that the new company will win out.

**NEGOTIATIONS HAVE JUST** been completed by which the Home Telephone company of Spokane, Wash., will have long distance connections with every independent telephone company in Washington and Idaho. It also has a contract with the Puget Sound Telephone company, which has connections with every independent line in the Sound country. These towns in the Spokane district have been added to the system: Pullman, Garfield, Oakesdale, Waverly, Mount Hope, Kendrick and Rockford, Wash., and Moscow, St. Joe, Harrison, St. Maries, Sandpoint, Post Falls, Couer d'Alene, Wallace, Wardner and Osburn, Ida.

**THREE MILLION DOLLARS** is the extent of the trust deed filed in Spokane county by the Home Telephone & Telegraph company of Spokane, Wash., in favor of the Title Insurance & Trust company of Los Angeles, Cal., the document being signed by Charles E. Sumner, president. It covers in blanket all the real and personal property, franchises, lines and extensions owned by the company. The company has bought a site for \$25,000 in the business district, and it is announced a \$60,000 office building will be erected the coming fall. The company will operate the automatic system, for which it has already signed 5,000 contracts in Spokane.

### Telephone Troubles

**P. C. CROTHERS**, Headland Tel. Co., Headland, S. D.  
(Being a Reply to a Toast at the Banquet of the last convention in South Dakota.)

"Mr. Toastmaster:

"Telephone Troubles is a pretty large subject; in fact, I am unable to understand why so large a subject was given to so small a man, unless it is that there seems to be a law in nature that requires the association of opposites. Under this law, the subject being a large one, very little will need to be said about it.

"As some of you know, I am a very modest man and loath to blow my own horn, but being a truthful one, I am forced to confess that if there is any place where I particularly shine, it is in shooting trouble; in fact, I get so carried away with the spirit of the thing, sometimes, that I feel like shooting the whole outfit.

"Telephone trouble is not limited to time or place. It may occur on the lines, in the switchboards, telephones or cables, or even with the patrons, but wherever it may occur, the burden of responsibility rests on the manager. He must take the kicks for it all.

"While looking through the exhibits this afternoon, I saw a lightning arrester that had a new-fangled kick-back coil attached to it. This suggested to me the idea that if some inventive genius could get up some kind of a high voltage, automatic, self-restoring kick-back arrangement that could be readily attached to the manager, it would fill a long-felt want.

"Mr. Toastmaster—Telephone troubles, may they never increase."



## The R-L Cords

The above is more than a trade mark. It stands for better service and lower cost of maintenance.

It has been our aim to make switchboard cords that would wear longer than any other. We use the best raw material it is possible to obtain, and spare no pains in workmanship.

As evidence that they do wear longer, many of the leading independent operating companies and manufacturers are using them exclusively.

Suppose you write for a list of companies using them and our prices, or send us a trial order—that's the best test. We guarantee satisfaction.

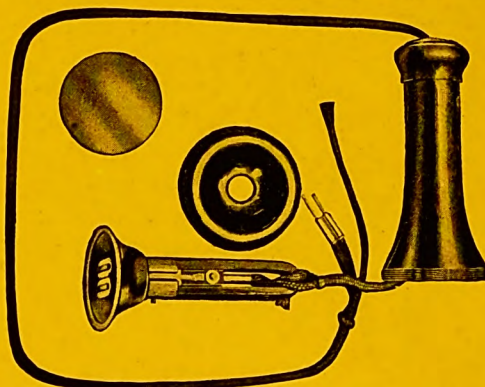
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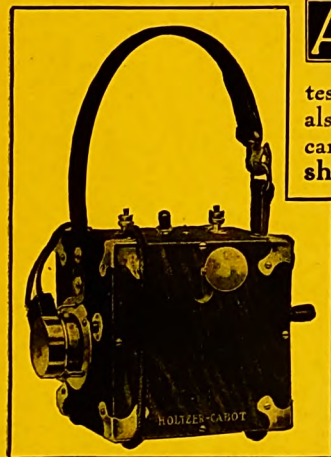
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**A** Receiver Type of testing set embodying every feature needed for all classes of testing. It has alternating and also pulsating current. The ringer can be thrown in circuit or shunted out at will.

It has a push button in the receiver so that when not talking or listening it automatically opens the receiver circuit. This device obviates manual switches, keeps the magnets from being demagnetized by the alternating ringing current, and allows full current for ringing the bell instead of being partially

shunted through the receiver. It is substantially made and is as light as is consistent with the durability of the apparatus.

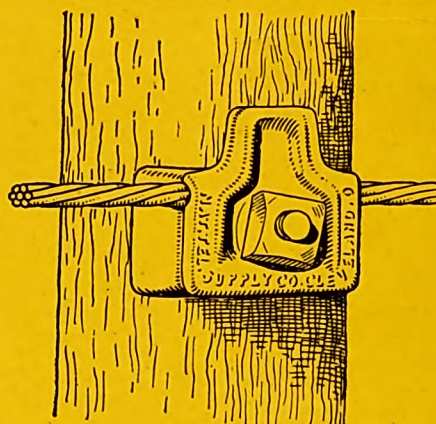
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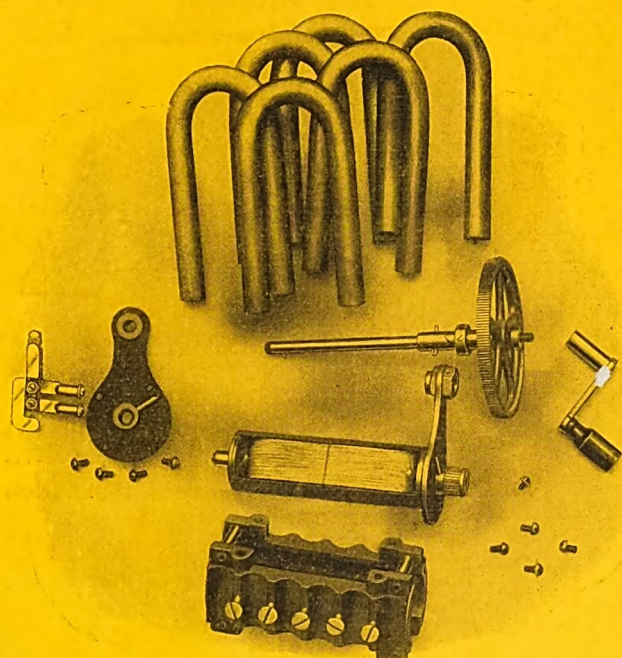
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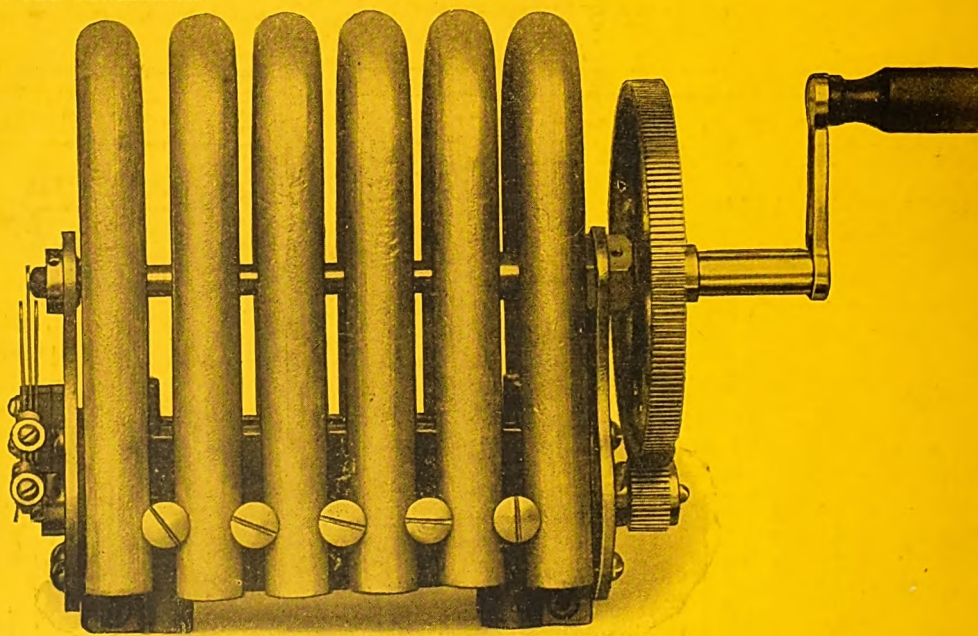
● Smallest airgap of any telephone generator made. The smaller the airgap the larger the output.

● Made either 4, 5, or 6 bar.

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Output  
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of Cost  
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Let us quote you.  
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Write us for special price on our 4 bar 1000 ohm new Round Bar Generator Telephones.



6 BAR SAMSON GENERATOR

## American Electric Telephone Company

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# SOUND WAVES

VOL. XII  
No. 5

INTERNATIONAL  
TELEPHONE JOURNAL

OCTOBER  
1906

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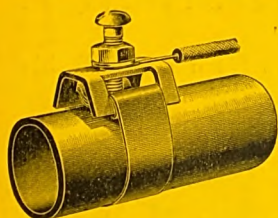
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Samples free on application. Write for list of  
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5, 6 and 7 Inch  
Stombaugh Guy ANCHORS  
have no Welds  
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BORE into the Ground  
NO DIGGING

When in at a depth of five feet  
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5, 6 and 7 Inch Styles Holds 12,500,  
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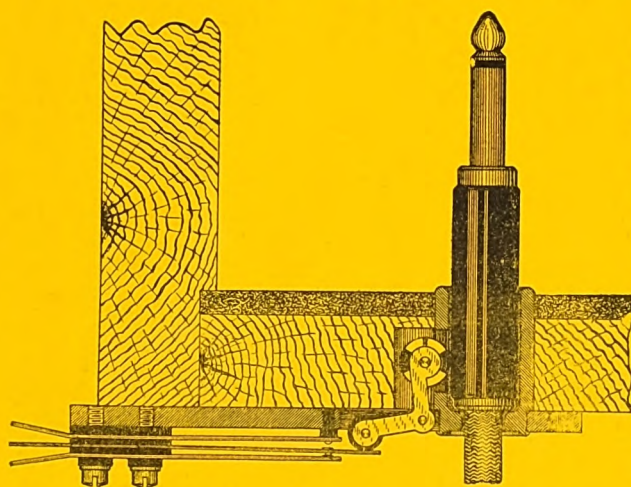
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# MONARCH



## PLUG SEAT SWITCH



The Plug Seat Switch shown in the illustration is a new piece of apparatus which embodies all of the well known characteristics of Monarch equipment. The switch springs are made of German Silver and their length insures long life and positive operation. The master spring rests against a hard rubber roller fastened to one end of the rocker arm which is pivoted in the solid brass mounting plate. To the other end of this rocker arm is fastened to a hardened steel roller which passes through the metal plug seat. While the plug is out of the seat the master spring makes contact with the upper spring and the steel roller is in a position to be engaged by the plug when returned to its place. The plug striking this roller tilts the

rocker arm so that the master spring breaks contact with upper spring and makes contact with one beneath. As both points of pressure on this arm are equipped with rollers, the friction is reduced to a minimum and the device is operated easily and positively.

The hardened steel roller will stand years of usage and furthermore it saves wear on the plug handle. The rubber roller prevents sticking and affords an insulation so that all circuits brought to the switch are insulated from the mounting frame. The flat mounting frame is provided with two small lugs with holes for mounting screws. The seat itself can be made for any plug and the whole device can be mounted in any make of switchboard.

The contact points are pure platinum and they are so located that the cords cannot touch them. The connections are made at the rear of the board where they are easily accessible.

If you have a transfer system or are contemplating installing one, it will pay to learn more of this switch.

# Monarch Telephone Mfg. Co.

## CHICAGO, U.S.A.





*Quick answer to the supervisory or clearing-out signal.* As such signals may be the result of an inaccurate or unsatisfactory connection they should be given special attention.

*Quick answer to the line signal.* Slow answers are always unsatisfactory to the public. Owing to the uncertainty of the load on any one switch board position it is impossible to secure equal loads on adjacent positions during the various hours of the day; when one position is very busy the neighboring positions are not.

To secure uniformly quick service it is necessary that each operator should answer any call within reach or by multiple, and in no way confine herself to the calls originating on her position. No line signal shall be plugged out until the operator is fully prepared to take the call.

*Rapidity of connection to the number called.*

*Accuracy of ringing.* False rings annoy the subscriber and increase the operator's load.

*Courteous methods of addressing the subscribers.* The public is our customer and must be treated with absolute courtesy at all times.

*Absence of "cut offs."* A "cut off" is the most annoying interference which can occur in connection with telephone service. For this reason pains are taken to make them not only unnecessary, but wholly inexcusable. When one does occur, any operator who discovers it must apologize for the interruption and give her first attention to restoring the connection.

*The essential element of good operating is accuracy.* If an operator speaks distinctly, rings distinctly, obeys her signals correctly, the service she renders will be satisfactory.

#### DUTIES OF OPERATORS.

They shall keep themselves fully informed with regard to the rules of conduct and the proper methods of handling the work assigned to them.

They shall be regular in attendance, and must report punctually at the hours designated. Should an operator be compelled to absent herself from duty, she must notify the chief operator, preferably by telephone, the cause and probable duration of absence.

Operators must conduct themselves at all times in, "The line is busy. Shall I call you?" in an orderly manner, and obey without question the instructions of those in charge.

They shall speak directly into the mouthpiece of the transmitter. The receiver must be retained at the ear continuously while the operator is at the switch board.

The attention of the operators is called to the fact that there is a legal penalty for the infringement of the secrecy of telephonic communication.

They shall quote numbers according to the system illustrated below and this system shall be used when speaking to the subscriber or with other operators.

- No. 100—1-00, one-double 0.
- No. 56—5-6, five-six.
- No. 202—2-0-2, two-0-two.
- No. 349—3-4-9, three-four-nine.
- No. 458—4-5-8, four-five-eight.
- No. 5-88—five-double eight.
- No. 610—6-1-0, six-one-six.
- No. 742—7-4-2, seven-four-two.
- No. 822—8-22, eight-double two.
- No. 956—9-5-6, nine-five-six.
- No. 1002—1-00-2, one-double 0-two.
- No. 1146—11-4-6, double one-four-six.
- No. 1248—1-2-4-8, one-two-four-eight.
- No. 1388—1-3-88, one-three-double eight.
- No. 1408—1-4-0-8, one-four-nine-eight.
- No. 1155—11-55, double one-double five.
- No. 1557—1-55-7, one-double five-seven.

- No. 1669—1-66-9, one-double six-nine.
- No. 1777—1-7-77, one-seven-double seven.
- No. 1114—11-1-4, double one-one-four.
- No. 1616—16-16, double sixteen.
- No. 2020—20-20, double twenty.
- No. 2002—2-00-2, two-double 0-two.

In answering calls they shall proceed as follows:

Use the answering plug nearest the answering jack in question. Take hold of the plug, never the cord, and insert it in the answering jack without changing hands. Operators should use either hand, right or left, according to the location of the answering jack.

Having completed the connection, ring the number called for; if, at the end of a reasonable time, the subscriber has not answered, ring a second time. If no answer is received, notify the subscriber by saying, "They don't answer." Do not ring a third time unless requested.

Disconnect at end of conversation, taking hold of plug (never of cord) and not dropping it until it is in its socket.

If the line tests "busy," notify the subscriber by say-

When the calling party has been connected with the desired number, but the latter has not answered, if the calling subscriber signals, the operator by means of the supervisory signal, the operator shall open the key and say, "I'll ring them again." In case a reasonable time has been given them to answer, she shall say, "They don't answer."

When the operator knows that the called for subscriber has answered, and either supervisory signal operator intermittently, she shall go in on connection and say, "Are you waiting?" and be governed by the wishes expressed by the subscriber.

Operators shall give precedence over all duties to the answering of supervisory signals.

#### TOLL LINES.

This bulletin contains instructions for the guidance of the toll operating department in handling the different calls and messages in connection with the toll lines of the Inter-State Independent Telephone & Telegraph Company of Illinois outlining the general principles involved and such primary rules and regulations as are capable of general application and which, therefore, must be followed in all cases.

These instructions supersede all others on this subject and must be put in force immediately after their receipt at any office.

Operators shall thoroughly familiarize themselves with the following instructions. Ignorance of these instructions will not be accepted as an excuse for their non observance.

Operators shall report promptly for duty at the hour designated, and shall not absent themselves from duty without first obtaining permission from their superior officer. If unable to report at hour assigned, an operator shall report as soon as possible, preferably by telephone, the cause and probable duration of the absence.

Operators shall be courteous in all their dealings with one another and with the patrons of the company.

While on duty in the operating room operators shall hold no conversations with one another beyond that necessary in the proper performance of their work.

Operators in operating room shall speak in distinct tones directly into the mouthpiece of the transmitter. The receiver must be retained continually at the ear while operators are on duty.

Employees in operating room are to be assigned personal numbers by which they will be known in connection with the company.

tion with the various records placed on the tickets and in their dealings with the public.

Operators shall familiarize themselves with the code.

The code signals to be used are given in the following list:

- A. B.—Anyone who can talk business.
- A. P. T.—Appointment.
- A. Y.—Anyone.
- B. Y.—Busy.
- C. A.—Cancel.
- D. A.—Don't answer.
- G. B. A.—Give better answer.
- L. K.—Telephone reached and looking for party.
- L. W.—Leave work.
- M. G.—Messenger.
- N. C.—No circuit available.
- N. D.—Absent. Not expected today.
- N. F.—No telephone listed.
- N. H.—Not there.
- N. R.—No report to give.
- U.—Out. Expected at.....(time)
- U. D.—Out. Do not know when party will return.
- U. N.—Unknown.
- W. H.—We have.

She shall see that the tickets in connection with each day's business are gone over, with a view of adding any information that may have been omitted or correcting any errors that may have been made by the operators in filling out the tickets.

She shall have the authority to cancel or reduce the charge for a message on which the service has been unsatisfactory, full explanation being made on the ticket.

They shall not refuse to carry out the requests of distant operators, unless previously instructed to do so by their superior officer. Operators shall never dispute with one another over the circuits or over methods of operating.

#### RECORDING OPERATORS.

They shall keep a record of all "Leave word" calls as they are referred to them by the line operators, both in connection with "sent" and "received" tickets.

They shall keep a record of all appointment calls, both sent and received, and notify the line operators five minutes before the time of the appointment.

They shall quote rates both to the patrons and the operators.

They shall have copies of the local telephone and city directories and shall, upon request from the line operators, look up numbers and addresses.

They shall send all messengers.

They shall try, upon request from the line operators, "don't answer" and "busy" telephones, reporting back to the operators the results of their attempts to obtain the parties desired.

The recording operator shall answer the party calling by saying, "Long Distance." and shall obtain and record on a "sent" ticket the following information:

The name of the party desiring service, if possible.

The telephone number of the party calling.

The name of the particular person desired.

The telephone number and name, or name and street address, or the name of the firm desired.

The name of place called for (city or town and state.)

If the particular desired party is out, the further wishes of the calling party.

In obtaining the above information the recording operator shall allow the party calling to give the call in his own way, without unnecessary interruption, asking only such questions as are necessary to complete the ticket.

The recording operator shall record on the ticket the time received.

The recording operator, in case the calling party desires to talk at specified time, shall write in the space headed "A. P. T." the time at which he wishes to speak.

If the party calling desires to have a messenger sent to the address of the party called for, the recording operator shall ascertain whether or not he wishes word left for the party called for; if out, shall write in the space headed "M. G." the code signal "L. W."

If the party calling desires the call cancelled, if the party called for is out, the recording operator shall write in the space headed "M. G." the code signal "C. A."

The messenger charge will usually be paid on all calls by the party calling. On a "collect" or "reversed" call, if the party calling will guarantee the messenger charge, this charge can also be sent "collect," to be paid to the messenger at the time the party called. If the party calling refuses to guarantee the messenger charge, do not reverse the call.

The recording operator shall have a list of "barred" or "no toll" telephones at her position and shall refuse to take calls for toll service from any of these telephones.

#### LINE OPERATORS.

On calls from telephones requiring an "O. K." from the proprietor, the line operator shall at once report to the proprietor the amount of the charge for the service.

The line operator shall place on the back of the tickets the different reports received and sent, using the code as much as possible.

The line operator shall refer to the supervisor all calls on which there have been a delay of twenty minutes and on which no definite report from the distant office has been received.

The line operator, upon obtaining a report in connection with a ticket, shall pass the report to the distant office. Some form of a report should be sent to the distant office at the end of fifteen minutes from the time the call was received.

Collect or reversed calls are those on which the charges are paid at the receiving office.

The names of the parties calling are to be obtained on all "collect" or "reversed" calls.

It is desirable that the subscriber shall be accustomed to uniform methods of dealing with the operators, as it tends to prevent unnecessary conversation and therefore tends to increase the uniformity and speed of operating.

Use as nearly as possible the following phrases on outgoing calls:

- Long Distance.
- Whom do you want, please?
- Has the party a telephone?
- Is Messenger O. K.?
- Are you the party who owns this telephone?
- What is your name?
- May I speak to the party who owns this telephone?
- Is it O. K. for this party to use your phone?

Use following phrases on incoming calls:

- Name of town.
- For whom?
- Has the party a telephone?
- Is messenger O. K.?

[NOTE—The foregoing rules were prepared by Miss T. Barnes, chief operator of the Springfield Exchange of the Inter-State Telephone and Telegraph Company. They have elicited flattering comment from leading telephone authorities, and we take great pleasure in presenting them in full to our readers.]



# The Independent Telephone Movement

This is the title of a large pamphlet sent broadcast over the land, but especially to bankers and banks, or other financial institutions. The object of its circulation is so evident that it is hardly necessary to say that it is to discredit Independent telephone securities.

Who is responsible for this circular or what it contains? The American Telephone and Telegraph Company of course. While the pamphlet contains no name, nor anything to show who wrote it, or even where it is published, any well-informed telephone man can readily trace its origin, and the object sought to be obtained by its publication. A few words in regard to the Am. T. & T. Co., usually termed "The Bell." The home of this company is Boston, Mass. Its president is Frederick P. Fish, an able lawyer and an acknowledged authority on all laws pertaining to telephony. Its principal assets consists of long distance telephone lines, valued at \$35,000,000, some real estate, and *securities of associated companies*. In Illinois it is the Central Union, except in Chicago, where it is the Chicago Telephone Company. In other states these associated companies do business under various names, but are always controlled by the parent company, the American T. & T. of Boston. The absolute control of these various companies (of which there are about thirty in the United States) is vested in the parent company because it holds the majority of stock in each and every company and thereby has full control of every one of its associate or subordinate companies. For instance, the American T. & T. owns 75 per cent. of the Central Union stock; 52 per cent. of the Chicago Telephone Company's stock, always a little more than one-half, so as to retain control, so when any one is dealing with any of these subordinate companies they are actually dealing with the American T. & T. Company of Boston, which company will hereafter be referred to as "The Bell" in this article.

Since its inception the Bell Telephone Company has invariably used coercive measures to accomplish its objects. While it was entrenched behind patents it flourished exceedingly, but when the patents expired it had incurred the animosity of a large majority of the people, with which it had ever come in contact in any way whatever. This is an old story which need not be repeated.

**UNBUSINESSLIKE METHODS:** The company resorted to every known method to retain its business, except the right one, and that was to deal fairly by the people along lines which brings success in ordinary business life. Having had a monopoly of the telephone business it could not change its methods of coercion which it had always practiced. The arrogance of its managers was sublime, but ridiculous, as well. The people rebelled and as a consequence came the Independent telephone movement. Even the Bell telephone managers cannot deny that the Independents have given them a world of trouble. As a natural consequence, the Bell Company has tried in various ways to squelch the Independents, but they are alive yet and are likely to be for a long time to come. Without reciting the various means resorted to by the Bell Company to stop the growth of the Independent companies reference will only be made to the last, that of discrediting the financial standing of all Independent companies.

WHO DID IT? The pamphlet heretofore referred to is

undoubtedly issued for that purpose. In its first paragraph it says that "A little more than a year ago a pamphlet containing a few plain facts about the origin and progress of the so called Independent telephone movement was *printed*." Let us stop right here and consider the above. A pamphlet was printed undoubtedly, but who edited and published it? Did President Fish of Boston write this pamphlet or cause it to be written, printed and sent broadcast from Maine to California? Was it to warn the dear public not to invest in Independent telephone stock or bonds? Undoubtedly. But in whose interest was this advice given? Judging by the past history of what the Bell Telephone Company has done for the people, the wildest imagination could not conceive it possible that that company, or its managers, could possibly do anything in the interests of the people. Its "Standard Oil" tactics are too well known to admit of any interpretation other than the circular was issued wholly in the interests of the Bell Telephone Company.

This 1906 pamphlet further says: "The publication provoked a storm of protest, but not a single denial of a claim in its pages was ever made."

**A STATEMENT CONTRADICTED:** As we are wholly unacquainted with the contents of that first circular no denial will be made in this article, but we will break the monotony which President Fish refers to by flatly contradicting one of the statements made in the 1906 circular and that is that the "actual Independent (telephone) movement was fathered by shrewd promoters." The circular goes on and tells all about the methods of the promoter, taking several pages in order to impress the reader that had it not been for the promoter there would have been no Independent telephone movement. This statement lets in a flood of light as to why the managers of the Bell Company pursued the course they did. If they are sincere in this statement, they thought they were dealing with promoters rather than the people.

**THE PEOPLE REBELLED:** The facts are, and it can be stated emphatically, that the people rebelled against Bell methods. The service was poor and prices high. It is not strange that President Fish, back there in Boston, should have made this mistake. The promoter had nothing to do about inaugurating a movement looking to the establishment of Independent telephone companies. The people endured the service until patience ceased to be a virtue and without for a moment considering the stupendous work before them they commenced building little Independent lines which have grown and expanded until a network of Independent wires gridiron all central and northern Illinois, and most of the states of the union, until the managers of the old company are resorting to all possible means to check the growth of their opponents, even to the issuing of pamphlets whose object is to discredit their securities! What about their own securities? What is the Central Union stock worth when it has not paid a dividend for many years? Among the assets of the American T. & T. Company is the stock of the Central Union, but at what price it is carried at on the books of the company is not shown in the directors' reports to the stockholders. But that is no business of ours. As long as the American T. & T. Co., can sell bonds it will not lack for ready funds, either to carry on its legitimate

business or to pay salaries and other necessary expenses connected with its literary bureau.

**MISLEADING:** This 1906 pamphlet seeks to mislead by giving a list of Independent telephone companies that have gone out of business for various reasons. While it is true that many little Independent companies have gone out of business, a considerable number of them have merely lost their identity in other larger and stronger Independent corporations. This derelict on the great ocean of literature, which is referred to as the "1906 pamphlet," for want of a better identity, is neither a roundling nor a bastard. It is an easy matter to determine its parentage. Its earmarks are unmistakable. It is to be hoped that in the future it will be issued from its birthplace, Boston, Mass., and signed by some responsible person.

**ONE CORRECT STATEMENT:** The 1906 pamphlet says that many Independent companies are finding out that their rates are too low. This is unquestionably the fact. Many of the Independent companies have grown to be larger than was ever expected when they were started and the managers of these prosperous companies do find themselves hampered by the low rates specified in their franchises.

**EFFECT OF THE 1906 PAMPHLET:** The question naturally arises, what effect has this literature to the Bell Company had upon the public minds. Unquestionably it has had some effect, apparently hurtful to Independent interests, or it would not be kept up, but in the meantime the Independents have been kept busy installing telephones, possibly a little too rapidly for their own good. Possibly some of the companies have expanded too rapidly and more money is needed than is in the treasury. The demand for Independent telephones is hard to meet, but so far there has been no serious difficulty in finding money enough to nearly supply the demand. Perhaps it is just as well to have a little conservatism forcibly installed into Independent telephone management. There is such a thing as getting along too fast. There is such a thing as too much prosperity. If the Independents are suffering from any troublesome condition it has come from this cause, rather than a dearth of business. Fortunately for Independent telephone interests money has been abundant among the farmers and that large class of well-to-do people who are looking for small investments. These people have been free to put their moderate savings into wellmanaged and prosperous home telephone companies. Every such investor strengthens the company not only with his money, but by what is of still greater importance, his influence. This is the mainstay of Independent home telephone companies. This is their Gibraltar. Protection to home industries, home capital. "Millions for defense but not one cent for tribute" to trusts or would-be monopolists has been, and still is, the battle cry. New York and Boston are headquarters of trusts, the example and teachings of which have unfortunately permeated to some extent the entire country, but the beginning of the end has come.

**THE TRUSTS ROUTED:** The unparalleled mendacity of the officers of the New York Life insurance companies and the coercive measures practiced by "Standard Oil" and other corporations have finally yielded to the power of the people and from this time on it will be difficult to restore the interrupted current of money heretofore floating in such vast quantities toward New York and Boston.

**HOW THIS EFFECTS TELEPHONE SECURITIES:** The west is prosperous. Money will accumulate there. The east, discredited by recent exposures, will have less money

to invest; the west will be slow to send money eastward. Western money will seek western investment, making it more difficult for a corporation like the American T. & T. to keep the pace it has been going (in borrowing money) and less difficult for the smaller Independent telephone companies of the west to secure enough to build such extensions as are needed to accommodate the increasing demand for Independent 'phones.

**NO PROFITS IN QUARRELLING:** A business is not built up by abuse. Quarrelling is unprofitable. There has been altogether too much of it between the Bell and the Independents. Too many parallel lines for profits. President Fish says that two telephone lines in one place is an economic mistake. But as his company failed to give the people what they demanded, and reasonably so, the Independents came in and occupied the field. Now they are expected to retire and make way for this eastern octopus which utterly failed to give the people either good service or reasonable rates, and in very many cases any services at all. The old Bell policy was to give a restricted service at a very high rate. "Make money while the sun shines" was their policy and it worked beautifully until competition came and then its managers commenced coming down off their "high horses" and have kept coming down until now they are begging the people, in many instances, to take their phones free of charge for a time, "just to see how they like them." "What a fall was there, my countrymen"---all in the interests of the dear people, according to the tenor of "pamphlet 1906!"

Mr. Fish, you may fool some of the people all the time; you may fool all the people some of the time, but you can't fool all the people all the time.

**THE PUBLICITY COMMITTEE** has been away on a vacation which fact must account for the lack of news of the state in this issue. The executive committee will meet within a few days and formulate plans for an active fall and winter campaign. It is proposed to make a thorough personal canvass of the state for the purpose of learning the exact conditions existing in the various parts of the state, and to gather full and reliable statistics regarding the business in the state, which will be made the basis of an exhaustive report in the near future.

**THE SECRETARY** has had prepared and distributed among the operating companies throughout the state a booklet containing the operating rules of the Inter-State Independent Telephone & Telegraph Co. in force at its Springfield exchange, as prepared by Miss Barnes, chief operator. Miss Barnes is recognized as an authority on this branch of the work in the United States. Her switchroom Mr. Dagger, of Toronto, pronounced to be the best regulated of any he had ever seen in twenty-five years' active experience in the telephone business. The secretary believes a careful perusal of the book and the application of the principles upon which the rules are based will do much towards bettering telephone conditions in the state. He will greatly appreciate expressions of views from the operating companies relative to these rules.

**THE BELL** says also that two telephone systems are a nuisance in Monmouth. Mr. McQuiston is taking them at their word and proposes to have just one system and that the Monmouth Home Telephone Company. He is getting there in good shape and will demonstrate to the people of that city his ability to "make good."

THE BELL COMPANY has had printed and distributed another of its anonymous pamphlets purporting to give "news" about the Independent telephone business. Among the places mentioned where Independents have gone to the bad is Decatur where everybody knows our friend Hankins is just now making it decidedly uncomfortable for the Bell. A reorganization for larger and better work the Bell seems to accept as an evidence of an Independent going to the bad. Everybody that knows anything about the matter knows that Decatur has one of the best built, best managed, best operated and efficient telephone plants in the state. It makes one smile to read such rot.

AND THEN AGAIN Des Moines, Iowa, is pointed as another center of calamity to the Independents. It would seem from information at hand that it is proving a calamity to the Bell instead. Through reorganization there has grown up in Des Moines one of the best plants in the west which now greatly outnumbers the Bell in telephones in service and is rapidly increasing in numbers. Now the fact of the matter is the Bell publishes for "new" a garbled statement of events that occurred five, six or even eight years ago, neglecting to tell the people present conditions and events of recent years. I haven't found for instance anything about the relative number of Independent and Bell telephones in use in Illinois, or adjoining states. Wouldn't it be interesting reading to publish a few FACTS.

THE FOURTH DISTRICT is planning a meeting at Champaign about the middle of October. They believe in planning ahead and getting to work in season. You can depend upon it a rousing meeting will be held. Savage lives down there, you know, and Wasson, too.

### Western Man Goes East.

M. E. Crow, for some time secretary and general manager of the Home Telephone Company, Elkhart, Indiana, resigned his position August 15 to take charge of the Independent Telephone Company of Aroostook county, Maine. Mr. Crow, who is one of the most efficient organizers in the telephone field, will construct about fifteen exchanges in that county. At the present time three of the company's lines are completed and three in course of construction. Mr. Crow has sent four good men from the central west down east to be associated with him in his development work. His home will be at Houlton, Maine.

### Railroad Train Telephone Service.

It is stated that telephone service has been established on all freight trains of the Galveston, Harrisburg & San Antonio between San Antonio and El Paso, and it is now possible for a train crew any place along the line to get connection with the train dispatchers along that division. The service is of the greatest value when a freight crew is caught out on a blind siding. He can get connection by the telegraph wire and receive his instructions from the dispatchers. In case of a wreck he can immediately telephone for assistance or instructions. Each caboose is equipped with a telephone instrument. With an extension fishing pole arrangement the conductor can make connections with the railroad telegraph

wires and reach the office he desires. At the same time the telephone is in use, messages can be transmitted by telegraph and neither message will cause interference with the other, each message being transmitted as though the other were not being sent.

### As to the Telephone Voice.

An Indiana telephone girl has won a rich husband because of her sweet voice. This leads the *Indianapolis Star* to remark that doubtless the husband is to be congratulated, because, as high authority has it, a voice gentle, soft and low is an excellent thing in woman, and is, it may be added, especially desirable in the case of the woman who presides over the domestic hearth. With this example before them, and others of the kind now and then reported, it might be thought that the young woman at the telephone exchanges would engage in systematic cultivation of sweet and musical intonation. There is, however, a much better opportunity before them for winning popularity than is to be gained by mere vocal sweetness, and that is promptness of speech and action. What does it matter to the average telephone patron, whether the voice of the operator at the switchboard is melodious or not if it is slow in coming over the wire, or if it is heard, after long delay, only to drawl "number?" and again "number?" after more delay, and then connects with a number quite different from the one the patron calls. What does it profit the telephone girl matrimonially or otherwise if she calmly, though in dulcet voice, declares to the anxious caller that the line is "busy now," and continues so to assert, while the impatient man at the other end of the wire with good reason to know it is not busy listens in a frenzied state of mind to her idle chat with her chums? Nay, verily, it is not sweetness for which telephone subscriber yearns, but for a swift answer to his calls and prompt and accurate connection with the other telephone. The voice may be shrill or sharp, or hoarse and rancous, or it may be impeded by a wad of gum, but it will win favor if it only responds quickly. If the telephone girl cannot be both mellifluous and prompt let her be prompt and she will be more likely to get a husband than through sweetness alone. Also she will do much to lessen the present sum total of unseemly wrath and profanity in the community. She may in fact, if she will, become a great moral agent.

### Bell Company in Trouble.

B. H. Mallory, an attorney of Hampton, Iowa, has filed a suit against the Bell Telephone Company. In his bill he alleges that on May 23 the company refused to let him talk over a Bell phone until he had paid a bill of \$3.50, which was disputed. The amount of damages asked is \$4,000. The petition alleges that Mallory had occasion to call up Attorney Ellis of Charles City, and when the operator notified him that Ellis was at the other end and ready to talk he stepped into the booth when he was presented with the bill and payment demanded. Upon his refusal to pay the bill, which he claims he does not owe, Mallory was refused the right to use the phone. Upon the grounds of the telephone being a public conveyance and that anyone who has the price should be allowed to use it, Mallory has commenced action for damages against the company.

# SOUND WAVES

A Monthly Magazine Devoted to the Interests of Independent Telephony

Vol. XII.

OCTOBER, 1906

No. 5

## SOUND WAVES

PUBLISHED MONTHLY AT LOGANSFORT, IND., U. S. A. PRICE ONE DOLLAR A YEAR  
COPYRIGHT, 1906.

Entered as second-class matter July 14, 1903, at the Post Office at  
Logansport, Indiana, under Act of Congress of March 3, 1879.

The Thos. H. Wilson Co., Logansport, Indiana, Proprietors and Publishers

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Telephone, Chicago Office, Harrison 1521, Chicago Telephone Co.  
Telephone, Chicago Office, 2904, Illinois Telephone Co. (Automatic)

## SUBSCRIPTIONS

One Year, United States and Canada . . . . . \$1.00  
One Year, Foreign Countries . . . . . 1.50  
Single Copies, each . . . . . .10

S. BENTELL & CO., 38 Maiden Lane, Covent Garden, London, Eng., British Representatives

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## EDITORIAL COMMENT

All communications to the advertising department of this paper should be sent to the Chicago office, addressed plainly to SOUND WAVES, 860 Monadnock Bldg., Chicago, Ill. All communications to editorial department, answers to want advertisements, subscriptions, etc., address SOUND WAVES, Logansport, Ind. Subscribers and others will confer a favor and facilitate the work of this paper by complying with the above request. Technical and news contributions will receive prompt attention and are respectfully solicited.

## BE TRUE TO YOUR COLORS.

It is hard to understand why Independent telephone men should purchase goods from concerns owned and controlled by Bell capital.

The profits obtained from such sales is used to fight Independent telephony and to promote the interests of the American Bell Company.

With millions of dollars and an unrivaled press bureau behind them, the managers of the Bell company know how to make use of the breach of faith of Independents who buy their apparatus.

The national convention passed a resolution positively prohibiting the purchase of new outfits from the Kellogg Switchboard & Supply Company which still poses as the "largest Independent telephone factory in the world."

Nevertheless, many Independent operators in the west still buy apparatus from the "tainted" firm, pleading in extenuation ignorance of the action of the association.

While the agents of the corporation preach "Independence" in the country, the managers in Chicago are selling goods to Bell operating companies.

SOUND WAVES would like to know if the Kellogg company has not recently bought a wood-working plant in Michigan for the manufacture of cabinet work for the Bell companies.

Has not the same company already sold goods to the Chicago Telephone Company and the Missouri & Kansas Telephone Company?

Is the same company not now making large quantities of apparatus for San Francisco?

Let us call a spade a spade.

The Independent operator who gives contracts for new equipment to Bell companies is a traitor to the cause. He not only injures himself, but is a dead weight to the entire Independent movement.

What is needed today more than anything else to



make the Independent movement a permanent success are men with backbone and principle—men who are wise enough to see that every dollar paid by Independents to Bell interests is a spike that will be used to nail them to the monopoly cross.

Meetings of state and district associations are well enough in their way; but unless the delegates take a vigorous stand against Bell encroachments nothing will be accomplished by such gatherings.

It is pleasant, of course, to talk and enjoy banquets, to indulge in social converse and exchange compliments. Sledge hammer blows are needed, however, not fine words, to arouse some of the members of the various state associations to the necessity of fighting the enemy instead of patronizing his manufacturing plants.

Lines equipped with Bell apparatus are advertisements for the Bell company.

Every purchase made by Independents from Bell-owned companies is heralded from one end of the county to the other and Independent purchasers are made to appear as patrons of the Bell monopoly.

It seems wondrous strange that, in spite of all that has been said and done by SOUND WAVES and the officers of the International Association, there are still scores of Independents who buy Bell apparatus.

And, stranger still, there are some men in the telephone business who apologize for the actions of such recalcitrants and not only find excuses for them but give them countenance by signing long distance contracts, even while "advocating" Independent action.

Honest Independent men cannot afford to make compromises with the Bell company, because they have neither the resources nor the backing to maintain an Independent position when the Bell may see fit to crush them.

Men devoted to a noble cause must be prepared to make a sacrifice now and then.

There is no doubt that the true-blue Independents will triumph in their struggle against unfair competition; because, wherever the issue is made clear to the public, popular sentiment is with them.

Nothing can defeat the Independent movement except those Independents who read Bell literature and permit themselves to be persuaded to buy Bell-made apparatus and sign Bell contracts.

#### HUMOR WITHOUT A POINT.

Some individuals, in and out of the editorial profession, have fantastic ideas of humor.

A short time ago the writer listened with agony to a preacher who labored under the impression that stale jokes would "liven up" his stupid talk.

He clung to this perverted idea with such persistency that his congregation agreed to pay him six months' salary in advance, provided he would agree to leave the town within two weeks after receiving his money.

Silly jokes, however, are not more out of place in the pulpit than is the reproduction of poorly-spelled business correspondence in the columns of a newspaper or magazine.

Every American is proud of the fact that in this country merit and honesty count for more than hereditary advantages.

There are many men in business in every state of union whose education has been neglected and whose spelling is miserable, but whose word is as good as a government bond.

There are, especially in the west, scores of successful men of foreign birth who have not had the opportunity of learning to write a letter according to Murray and Webster, but who are, nevertheless, deeply and vitally interested in the progress and development of the land of their adoption.

Some of them are champions of Independent telephony and ever ready to make sacrifices for the cause of the people against organized rapacity in every form.

To lampoon such men just because they have not mastered the intricacies of the English language is a boorish offense for which no excuse can be accepted.

It is just as much a breach of good manners as are the puerile cartoons and squibs aimed at farmers which are published in some journals that make some pretensions to respectability.

In the Independent telephone field especially the farmers occupy an enviable position. They do not listen to the voice of the Bell tempter and the great majority of those who have anything to do with the purchase of telephone apparatus patronize Independent manufacturers.

Moreover, farmers as a class have a strenuous desire for telephone connections with the town exchange and consequently are potential factors in the upbuilding of the Independent telephone field.

The man who promptly pays his debts, and places no order without having the money to pay for it, is entitled to respect, and anyone who attempts to make him an object of ridicule writes himself down as devoid of that good taste which makes the gentleman.

#### FAME BUILT ON SILENCE.

King Solomon made some pertinent remarks about the man who "seeketh wisdom," because "her ways are ways of pleasantness and all her paths are peace."

Another wise man discoursed with equal terseness on the value of what the street boys call "keeping your mouth shut" and we are all supposed to know that "speech is silver and silence is golden."

And still another ancient authority, with a good-sized grouch, wished that his enemy might write a book.

These same old saws and aphorisms have been used by hundreds of "poseurs" as an excuse for not expressing a view on any subject upon which there happens to be a difference of opinion.

They merely look solemn as owls, wink their eyes and say nothing, leaving the questioner under the impression that they might say much—if they wanted to.

But the fact of the matter is, these fellows are mere pretenders, negative creatures whose opinion or judgment is not worth having.

They know nothing and are wise only because they succeed in hiding their ignorance in silence.

It is equally true that many men rush into print to exploit theories in which nobody seems to be interested.

They are convinced, however, that they have a mission to perform and seek to educate the people through the public prints.

And history proves that some of them have accomplished much and many of the "agitators" of yesterday are the philanthropists and heroes of today.

In the world of science much has been achieved by literary agitation. The vagrant thought of one inventive genius has frequently been transformed into a practical machine by the matter-of-fact brain and hands of another, but more humble, seeker after truth.

Technical science should always be reciprocal in its aims. One man may possess the gift of thinking, the other the power of execution.

Together they form a combination which is of inestimable value to mankind; hence the man who, like a sponge, absorbs what he gets from others without giving a return is unworthy the name of scientist.

On the other hand, there are individuals who constantly are on the alert to appropriate the ideas of others without ever doing any thinking of their own.

They are the parasites of the scientific world—the silent members who have nothing to say, who pose as "authorities" and work themselves into the confidence of amateurs.

When asked by technical journals for contributions they are apt to take a high and mighty stand, excusing themselves by stating that "they never write anything for publication."

The "silver speech and gold silence" theory does not apply to scientific men who think. But for pretenders it is a safeguard.

In the telephone field, as in other avenues of scientific effort, the men who are possessed by ideas are glad to take the world into their confidence.

SOUND WAVES has among its contributors experts who freely impart their knowledge to the less informed, who labor industriously to promote the scientific development of telephony.

Nevertheless many an editor is delighted that some so-called "authorities" have the good taste of declining to write.

Probably they realize that Providence has not blessed them with originality of thought and fear that their self-made reputations might suffer if they exposed their limited knowledge in print.

Truly, silence is the only way by which they can maintain their reputation for wisdom and their refusal to write for publication is a blessing to themselves no less than to the reading and thinking world.

In their own peculiar way they find ways of pleasantness and quiet paths of peace.

### HE SHOULD BE SILENCED.

It is understood that Editor McVicar, of the *Bulletin of the League of American Municipalities*, will endeavor to use the coming convention of the league to justify the correctness of his position on the Independent telephone question.

The league will meet in Chicago on September 26, 27 and 28, at which time he proposes to present data refuting the claims of the Independents.

It is safe to assume that the ammunition, statistical and otherwise, Mr. McVicar intends to use has been furnished by the Bell company.

For this reason it is highly important that the Independent managers should be represented at the league convention to maintain their just claims and present complete data on the situation as it exists today.

Many of the 2,000 delegates to the league convention are not familiar with telephone affairs and misleading statements should not be permitted to find lodgment in their minds.

The International Association should present a comprehensive statement of existing conditions to the convention, which document should be re-enforced by the presence and voice of such men as President Hoge, of Cleveland; Mr. Moulton, of Minneapolis; Mr. Conklin, of Aurora; Mr. Critchfield, of Milwaukee; Mr. Bassett, of St. Louis; Mr. Cheadle, of Joliet; Senator Kline, of Pennsylvania, and others of equal standing in the Independent world.

Editor McVicar does not represent the sentiment of the League of American Municipalities in his self-constituted organ, but if the Independent leaders ignore his misrepresentations and permit them to stand without a logical contradiction many business men not familiar with the situation may be misled.

### MORE PUBLICITY BADLY NEEDED.

The Independent telephone interests are penny-wise as far as expenditure for purposes of publicity is concerned.

The Bell Company spends thousands of dollars every month to keep itself before the public in a favorable light. It maintains a department of publicity second to none in the country. The daily and weekly press is supplied with well-written news and editorial matter and the men within its own organization are kept informed of every de-

velopment in the field by means of circulars and local Bell publications.

The success of every movement depends upon co-operation, cohesion and organization.

Independent telephone men maintain associations in various states. They meet once or twice a year, talk over toll rates and Bell competition and adjourn.

Only two states carry on a systematic campaign for the upbuilding of Independent interests and the bringing together of the men who own Independent properties.

The monthly bulletin of the Illinois Association, which forms an interesting part of the Illinois edition of SOUND WAVES, is accomplishing grand results. It is uniting the operators in the different sections of the state and clearing up stray doubts that have worked here and there against complete harmony.

Emerson's famous sentence, "Each for all," needs to be heeded wherever Independent telephones are used.

It has long been the aim of the Bell company to carry confusion into the Independent camp. The means used have not always been above reproach. In some localities jealousies have been aroused, in others exchanges have been bought at high prices, the difference between value and price paid presumably being charged to the advertising account.

SOUND WAVES realized that something had to be done to neutralize the effects of the Bell publicity department's agitation, and proposed to the Illinois Association to print a monthly bulletin in a special edition for Illinois subscribers.

The offer was accepted and the results have been more than satisfactory. The telephone men are becoming acquainted with each other and are acting together for the common welfare.

If the Bell Company foments trouble in Northern Illinois the men in the Southern part of the state are informed of the situation and prepared to ward off similar attacks that, sooner or later, will be made against them.

Several other states are about to follow the splendid example of Illinois—notably Missouri, where the Independent cause needs vigorous defense—and before long SOUND WAVES will probably print a number of valuable state editions which will cement the operators into an aggressive society of successful business men.

Feelings of distrust now existing in several places, and carefully nursed by Bell representatives, can be removed effectually by the publication of actual facts.

If, here and there, an Independent belongs to the porcine family his bristles are sure to be shaved off by the cutting comments of the state editors, who are members of the state associations.

In no other field of commercial endeavor is there more need of publicity than in Independent telephony.

There is absolutely nothing to hide and all that is needed to make it triumphant everywhere is a strong personal union and constant communication between the men who control it, and the public.

SOUND WAVES, at some loss to the publishers, has pointed out a way that is sure to accomplish splendid results; and the state association which, either through ignorance or carelessness, fails to inquire into its merits is guilty of a grievous mistake.

The Bell company is spending millions to keep in touch with the public and its managers and employes.

What are you paying out, Mr. Independent Operator, to enlighten the people of your state and to strengthen the bonds between yourself and your fellow Independents?

### LET US BE HONEST.

Honesty in business is a virtue that is appreciated by all men.

Cant and hypocrisy may win for a day, but in the long run they bring failure and disappointment.

A short time ago the editor received what might be called a prospectus from an individual engaged in the promotion of a telephone company.

The gist of the document was an appeal to the cupidity and prejudice of the people.

Instead of pointing out the really beneficial principles of Independent telephony he made promises which no honest man could possibly keep.

He agreed to furnish an up-to-date telephone service at a price entirely inconsistent with good business methods.

His principal aim seemed to be the selling of stock and in order to promote his scheme he gave fictitious figures about telephone profits.

He pointed out that the Bell Company was earning a vast fortune for its stockholders every year and added that Independent companies were doing a still more remunerative business, because in closer touch with the people.

The rates, he continued, could be cut down one-half and still leave a fine margin for the investors.

We do not know how the man prospered in his enterprise.

But we do know that he is a liar, pure and unadulterated.

Independent telephony is an honest business, built on a sound basis and conducted by men of honor.

There is not an Independent company in the land which shows usurious returns on the capital invested.

Most of the companies, it is true, are prosperous and pay a fair percentage of profit, and the public is glad that such is the case.

Most of them are well equipped and give good service to their subscribers.

Were it otherwise the Independents could not compete successfully with the Bell exchanges.

But considering the capital invested, the cost of main-

tenance and depreciation of equipment, telephone companies earn but a modest income.

Independent companies, in many cases, are financed by local capital—by men who have at heart the welfare of their neighbors.

In some places they are a tangible, effective protest against the monopoly which is always seeking to crush competition, by fair means or foul.

Independent telephony, as its name implies, is a high-class business, and fellows who make use of its deservedly fair name to mislead the people should be made to suffer.

Advocates of Independent telephony and builders of Independent lines can be honest always.

They stand for the people and against organized rapacity and monopoly; for fair treatment and against financial piracy; for legitimate profits and against questionable promotion.

These are some of the reasons why they can afford to tell the truth everywhere and at all times.

### POULSON, THE DANISH EDISON

"It is one of those things which open the eyes of all scientists."

This is what Sir William Freece said, after seeing a demonstration of Valdemar Poulson's "speaking telephone." Since that epoch making invention Poulson has kept steadily at work, and now, at the age of 30, he ranks among the most brilliant electrical engineers of the day. He has discovered principles in electro-magnetism which have turned upside down what the text books say on the subject, and scientists everywhere follow his researches with the closest attention.

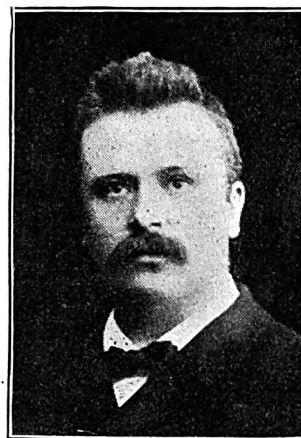
Poulson is a native of Denmark, born in Copenhagen, in 1874. His early education was received in the public schools of that city, after which he passed through the best European technical schools.

One of the inventor's earliest successes was in connection with the laying of a submarine telephone. About four or five years ago the German government applied to the foremost scientists of Germany for a submarine telephone, but they were unable to produce anything satisfactory. Poulson was then appealed to, and succeeded in laying a cable by which it was possible to telephone under water a distance of twenty-five miles.

The inventor owes a great deal to the generosity of the late S. Lemvig-Fog, a Copenhagen financier. Some years ago Mr. Fog gave Poulson \$50,000 with which to carry on his experiments, and today he has one of the best equipped laboratories in the world, in which he conducts his researches, assisted by a large staff of trained engineers. For many years Poulson has been associated with a Mr. Peterson, a college chum and one of his closest personal friends. Mr. Peterson is possessed of a keen mechanical bent and works out the theories which the active mind of Poulson evolves. He, too, is young, being only 31 years old.

In the United States Poulson's name is familiar mainly as the inventor of the telegraphophone. It is not only the broad commercial possibilities of this invention which make it a remarkable achievement. It is the fact that it is based upon an entirely new principle in physics—that magnetism can be localized.

Applying this principle in a practical way, Poulson evolved a machine which records speech, music or any sound such as the ticking of the telegraph, storing the sound record in the form of magnetic impressions on a fine wire or steel plate. The practical uses of the machine are the same as those to which the phonograph is put—and many more. Linked with the telephone, the telegraphophone makes a permanent record of everything that passes over the line; it takes dictation at any distance covered by the telephone, and takes off, with perfect distinctness, the records made in this way. American capital, seeing the great money making possibilities of the telegraphophone, is backing the erection of a plant to manufacture the machine here, and meet the ever-increasing demand.



VALDEMAR POULSON,  
Danish Inventor whose Work is Attracting Attention  
the World Over.

Lately Poulson has been giving his attention to wireless telegraphy, and has succeeded in perfecting a system of his own, which has the great advantage of being absolutely selective. It has always been possible heretofore with other systems to tap messages, and efforts have been made by tuning to obviate this difficulty. Poulson has now discovered a way by which it is possible to send a message so that it can be received only by the station for which it is intended. Some time ago Poulson conducted experiments in his laboratories to show what his system was capable of. Half a dozen receiving stations were fixed up around the room, and the inventor was able to send messages to any one of them without any of the others being affected. So far he has succeeded in sending messages a distance of 300 miles over land, which is equivalent to about 1,200 miles over water.

This is not a complete catalogue of Poulson's achievements, but it is enough to show why he is called the "Danish Edison," a title conferred upon him when the telegraphophone was first exhibited at the last Paris exhibition.

### Chance for American Capital.

Maxwell Blake, United States consul at Funchal, reports that a telephone system is badly needed on the island of Madeira. The country contains 150,000 people, one-third of the number residing in Funchal, a rich and prosperous city. The island is 36 miles long and 3 miles wide. A franchise for a telephone system might be secured from the Lisbon government, especially if Portuguese capital were interested in the enterprise.



MANAGER TELEPHONE SYSTEMS DEPARTMENT OF EDWARDS-HINE COMPANY

Under the heading of "Accounts Receivable" come



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counts; capital stock; bonds issued; bills payable; open accounts payable; voucher accounts payable; advance rentals; unpaid wages; surplus account; unpaid dividends; depreciation; rental earnings; toll earnings.

In considering the subject of construction charges the question presents itself:—"What are legitimate charges"?

cost of moving telephones and changes of subscribers' equipment when these cannot be charged to subscribers, cost of removals, etc.

Operating expenses include the cost of maintaining the traffic department, salaries of local and long distance chief operators, inside trouble clerks, service inspectors,

Form 10.	Form 11.	Form 12.
		
The Delaware Tel. Co., Nowata, Ind. Ter. <b>IN</b>	The Delaware Tel. Co., Nowata, Ind. Ter. <b>OUT</b>	<b>THROUGH</b>
Date _____ 190__ Phone No. _____	Date _____ 190__ Phone No. _____	Date _____ 190__ Ticket No. _____
From _____	Subscriber _____	From _____
Party Talking _____	Party Talking _____	At _____
At _____	Authorized by _____	To _____
To Whom _____	To Whom _____	At _____
Party Wanted _____	Party Wanted _____	Rec'd _____ M. Sent _____ M.
Authorized by _____	At _____	By _____ Opr. By _____ Opr.
Rec'd _____ M. Minutes _____	Rec'd _____ M. Minutes _____	Line No. _____ Line No. _____
By _____ Opr. Toll _____	By Rec. Opr. Toll _____	Remarks _____
Began _____ M. Messenger _____	Sent _____ M. Opr. Messenger _____	
Ended _____ M. Total _____	Began _____ M. Total _____	
Line No. _____	Ended _____ M. Line No. _____	
Remarks _____	Remarks <b>CUT NO 3</b>	

These include original cost of real estate, buildings, right-of-way, cost of franchises, engineering, expenses incurred in negotiating stocks and bonds and discounts allowed on same, interest on bonds during construction, material used in construction, with freight and cartage and cost of labor, switchboard, wire plant, substation equipment and all improvements or additions which increase the value of the original investment. This embraces the cost of new

cost of power for operating central office plant, substation batteries, as well as a pro rata proportion of stationery used, light, fuel, heat, and water, dining room expenses, etc.

The General Expense account covers all accounting and filing department expenses, such as salaries of managers and assistants, clerks, etc., not chargeable to previous accounts mentioned. Into this account can be closed at the end of a period the expense of collectors, directory, stationery, and also printing, advertising, office supplies, light and heat.

The subject of depreciation is a puzzling question over which the average Board of Directors in the rapidly growing telephone companies throughout the country has had many struggles. The border line between maintenance and depreciation seems hard to define to the management, who are not versed in accounting methods. Cost of maintenance can be closely estimated by almost any observant manager and its charges are quite fully defined in a previous section, while depreciation is, in

Form No. 11. DUPLICATE.

Name \_\_\_\_\_ Telephone No. \_\_\_\_\_

Remarks \_\_\_\_\_

**COLLECTOR'S COUPON**

Name \_\_\_\_\_ Telephone No. \_\_\_\_\_

Remarks \_\_\_\_\_ Amount Paid, \$ \_\_\_\_\_

Collectors Name \_\_\_\_\_ Date Paid \_\_\_\_\_ 190\_\_

M. \_\_\_\_\_ Houlton, Me. Telephone No. \_\_\_\_\_

**TO Independent Telephone Co., Dr.**

For Toll Service During the Month of \_\_\_\_\_ 190\_\_

PAYABLE ON PRESENTATION. MAKE ALL CHECKS PAYABLE TO THE COMPANY.

Day of Month	PARTY TALKING	TO WHOM	LOCATION	TOLLS	REMARKS
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					

Rec'd Payment \_\_\_\_\_ Date \_\_\_\_\_ 190\_\_ Total Toll Service \_\_\_\_\_

Independent Telephone Co. **CUT NO 4** Toll Bill and Mess. \_\_\_\_\_

work installed to replace old, less the cost of the old; the difference between the cost of iron and copper in replacing iron with copper wire, etc.

Maintenance charges are supposed to cover the cost of material and labor expended in keeping up the inside plant, subscribers' equipment and lines in good condition, thereby making good, natural wear and tear and damages by storm or accidents. This division properly includes transportation and traveling expense incurred by men while clearing trouble, wages of wire chief, switchboard men, trouble men, inspectors, etc. It also takes in the

Form No. 12. DUPLICATE.

Name \_\_\_\_\_ Telephone No. \_\_\_\_\_

Remarks \_\_\_\_\_

**TO Winona Telephone Company, Dr.**

All Rental Bills due and payable in advance of each quarter, on presentation. Make all checks payable to order Winona Telephone Company.

To Rental of Telephone Exchange Service—

From \_\_\_\_\_ to \_\_\_\_\_ at \$ \_\_\_\_\_

From \_\_\_\_\_ to \_\_\_\_\_ at \$ \_\_\_\_\_

Toll Service for \_\_\_\_\_

Total, \_\_\_\_\_

Received Payment \_\_\_\_\_ 190\_\_

WINONA TELEPHONE COMPANY. Per **CUT NO 5** Collector.

Telephone No. \_\_\_\_\_

To Winona Telephone Company, Dr.

Rental—

From \_\_\_\_\_ to \_\_\_\_\_

From \_\_\_\_\_ to \_\_\_\_\_

Toll Service for \_\_\_\_\_

Total, \_\_\_\_\_

Date paid \_\_\_\_\_ 190\_\_

Collector.

nearly all cases, an undetermined quantity. It is a reduction of the assets of the company resulting not only from natural wear and usage but more frequently from

not exceeding ten years. Instead of charging direct to investment accounts, thereby reducing insurance values, depreciation can be charged to the profit and loss account, and depreciation account credited, thus showing as a liability.

Cut No. 1 shows a simple form for general ledger ruling, the broad space for debit items provides room for

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Form F-15-C—Cash Book, Cut No. 2:—The left hand, or “Cash Receipts” side of this form is designed to be used to show the entire receipts of the business, arranged with three columns not headed, to take care of any special features; we recommend that all cash received be deposited in the bank; each bank deposit will then balance

Each day's toll tickets should be sorted by the night operators, by telephone numbers beginning with the lowest number and then examined by the chief operator, so that any omissions or errors can be corrected when the facts can be readily verified; they are then ready to be turned over for the billing clerk.

Page 6-99 R.

No. NAME

PRIVATE METALLIC

PARTY METALLIC

PARTY GROUND

LOCATION

DATE CONNECTED

19

DATE DISCONTINUED

19

YEARLY RATE \$

PAYABLE MON. QUAR. ANNUALLY

REBATE \$

ACCOUNT

BUS. RES. RURAL

YEARS 19 AND 19

YEARS 19 AND 19

YEARS 19 AND 19

TEL. No.

MONTHS OF SERVICE FOR												MONTHS OF SERVICE FOR																		
	BALANCE	RENTAL	TOLLS	MISCEL.	TOTAL	PAID	BALANCE	RENTAL	TOLLS	MISCEL.	TOTAL	PAID	BALANCE	RENTAL	TOLLS	MISCEL.	TOTAL	PAID	BALANCE	RENTAL	TOLLS	MISCEL.	TOTAL	PAID	BALANCE	RENTAL	TOLLS	MISCEL.	TOTAL	PAID
Jan.																														
Feb.																														
Mar.																														
April																														
May																														
June																														
July																														
Aug.																														
Sept.																														
Oct.																														
Nov.																														
Dec.																														
1919																														
Jan.																														
Feb.																														
Mar.																														
April																														
May																														
June																														
July																														
Aug.																														
Sept.																														
Oct.																														
Nov.																														
Dec.																														
1920																														

CUT NO. 8

1919

1920

Toll Bill, Cut No. 4, Form G-84:—This is a duplicate form with a carbon sheet to be folded in, so that an itemized carbon copy of each subscriber's monthly toll bill is on file for immediate reference. Form shown is for long hand work with stub pen or special pencil; a different style bill is provided where typewriter is used. All toll ticket charges for previous day should be billed; starting

[illegible]

a separate bill for each subscriber as the first charge for the current month is received by the bill clerk; when each day's charges are billed, the toll bills should be filed away in vertical file in consecutive numerical order between guide cards for every 10th number, making them conven-



On last day of month, bill is footed, the original torn off and arranged by routes for the collector or mailed with request for payment. Duplicates to be totaled to give the toll earnings for month and amount of each bill charged to the ledger accounts of subscribers. The duplicate can then be filed temporarily, in cheap alphabetical binder to be stamped paid and removed when paid, to a vertical file between guide cards, a card for every twentieth number.

It has been found that a quarterly balancing of the account is conducive to better collections. This form will carry a subscriber's account for two years, both sides of sheet being ruled for this purpose. Being loose leaf, another loose-leaf form very desirable in Exchanges where few changes occur as two sides of form will carry an account 12 years if desired. Column headed "Miscellaneous" can be kept in consecutive numerical order by tel-

[illegible]

Form G-90, Subscribers' Ledger, Cut 7:—This is another style of a loose-leaf record which provides for a four years' record (of both rental and toll charges) with each subscriber. The heading provides space for all necessary information. Yearly totals are secured by adding sideways instead of vertically.

Form G-90, Subscribers' Ledger, Cut 8:—This is

Form 6. 100M 8-10-05		Form No. 6-A 50m-2-1-'05		Detected Switch Trouble Slip.	
No.	Date	No.	Date		
Name		Trouble			
Location		Reported by			
Trouble reported		Time Reported			
Trouble tested		Repaired by			
Time reported	Started	Time Repaired			
Trouble found		Trouble Found			
Repairman		CUT NO 11			

Form G-90, Subscribers' Ledger, Cut No. 9:—This is a bound book or loose-leaf Subscribers' Ledger, one long and one short sheet carrying 12 subscribers' rental and toll accounts for a year, with a cash and rebate column, two lines allotted to each subscriber, upper line for rental entries and lower for tolls for both debit and credit entries.

Form G-90, Toll Record, Cut No. 10:—Some companies prefer to keep all toll charges in separate record. This form provides space on two (face to face) pages for 25 subscribers' toll charges for a year.

Form G-67, Pay Roll, Cut No. 12:—This very complete form is designed both for small local exchanges, branch exchanges, or foremen's pay rolls. Space is pro-

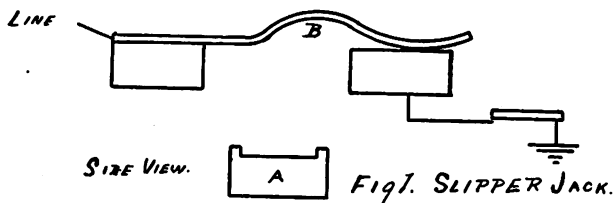
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# The Evolution of the Telephone Exchange

By P. KERR HIGGINS

The telephone has been in use twenty-five years, that is practically; its life, however, in the sense of its switching facilities between one subscriber and another, is of much shorter duration. The writer can well remember his first experience in a telephone exchange over twenty years ago, in what was then known as the Queen Street Exchange of the National Telephone Company of Glasgow, Scotland. At that time the switchboard consisted of different colored brass-bars, placed one upon another, with holes perforated in each, so that any two subscribers were connected by placing their plugs on a similar colored bar. Calls were taken by a boy in front of the board who, on receiving a ring on a certain line, would place one plug end of a cord in the hole of one of the answering strips and the other plug end in the connecting strip of a table fitted with a telephone outfit for this purpose; these tables looked like the sewing machine tables of today. All ringing was done either by pressing a battery button or, later, a boy was detailed to turn the crank of a kind of magneto. This he kept up constantly, being relieved at intervals by another boy. No clearing out signal was used. The wires of the exchange were strung in every direction and the noise and confusion were something awful.

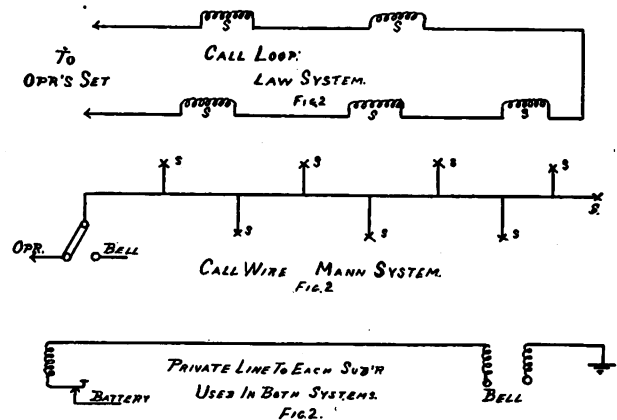
A little later a great change commenced to take place in the exchange. With these came, shortly after, the drop or, as it was then called, the indicator; also a form



of slipper jack, having a chair A and a slipper B as shown in Fig. 1. The drops and jacks were clumsy and occupied considerable space, the plugs naturally being equally clumsy. The Law system, shown in Fig. 2, simplified things for a while and gave fair service, but was expensive to maintain and unreliable. As the systems became more efficient, better understood and consequently handled more intelligently, the prices changed slightly for the better and the people came to consider the telephone service not only novel, but almost a necessary convenience, and so, as "necessity is the mother of invention," new features were constantly introduced, such as the transfer, the improved Law, known as the "Mann," etc. The single cord board shown in Fig. 8, and the unit transfer board shown in Fig. 9 are typical of the period. The former was used considerably in Europe and the latter in Europe and South America.

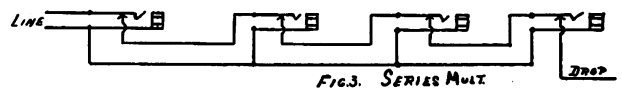
While the multiple switchboard was known about this time, it was not appreciated or adopted to any extent until about 1885. The first boards introduced were of the series type, shown diagrammatically in Fig. 3; later the bridging type, shown in Fig. 4, was introduced and is more or less in use today, except where the modern automatic system has been introduced. Such evolution changed the calling system from the call bell to the drop, then finally to the call lamp.

Then there was another lull in the development of the exchange equipment, representing the stage of passing from the magneto call to the central energy call. This seemed to many like going back to old methods and it was, but these old methods had been changed from the crude to the developed so that they now fulfilled the requirements of the hour. This centralized battery system was, and is, of two kinds:—(1) That having central



battery for signalling only. (2) That using central battery for both signalling and talking. The former is called partial and the latter complete central energy. The old magneto call, much of which is still in use in the smaller exchanges, is well known to the average user of telephones and is very easily understood by the non-telephone man because of its simplicity, hence entering into detail regarding the same would be waste of time.

It is my intention, therefore, to consider only the modern systems in use at the present, they being the central energy in its two forms and the automatic, which is the latest development in the telephone art and which is apparently destined to become an important factor in some form during the ensuing five years. The time is now here when the problem of deciding which service is best to introduce is not by any means easy, for the reason that the present time is a transient one. We know that many defects exist in the central energy and except for very small plants we would not dream of putting in the old magneto system. The Law and Mann systems are a thing of the past and the automatic is so new that we do not feel quite sure of it as yet, so we stand on the threshold of a third period, those of us who contemplate new or reconstruction work wondering and



figuring what should be done. Not only this, the automatic of today will not be the automatic of next year. Every day changes are being made, new improvements added, faults found and remedied, and all this means a process of evolution, which is apparently endless.

It will be my effort to consider these two important systems as they exist today, pointing out the strong and weak points in each and, if possible, forecasting in some measure what I consider the switchboard of the future will be. The size of the exchange at the time of comple-

tion does not always indicate the probable growth of the system, hence the possibilities of growth in the immediate future (say five years) must be considered in deciding what system shall be introduced and the ultimate capacity of the central office apparatus. It is an admitted fact that great saving in maintenance is possible by the use of complete central energy as against the use of local batteries, but it is more imaginary than real since the introduction of a cheap dry battery with an average life of about one year. It is also admitted that locally the service is equal, if not the superior, of the local battery, because the centralized battery is more uniform; for while it may never attain the high efficiency of the local battery cell neither does it reach the low ebb of the local cell, when not properly maintained, a thing which is ever possible and present with us. On a long talk the centralized battery is also more efficient than the local battery. In the case of long distance work it is an admitted fact that local batteries properly maintained give better service than central battery, and direct connection is possible without the use of repeating coils or other apparatus which are so liable to reduce the efficiency of the talking. The use of central energy was impossible until the introduction of the modern accumulators. Their low resistance, long life, and high efficiency with minimum space made their introduction both rapid and permanent, and it is the feeling of most engineers that while their form and usefulness will be improved upon in the near future they are likely to remain with us a long time be-

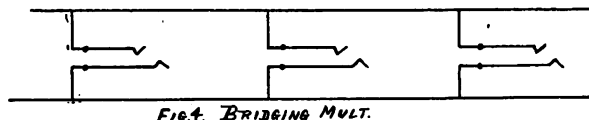
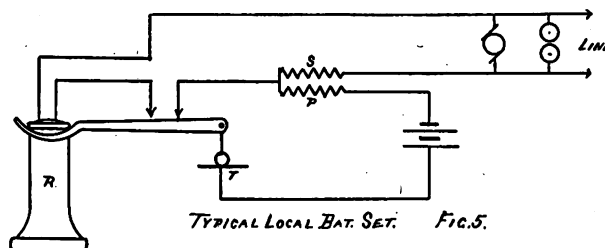


FIG. 4. BRIDGING MULT.

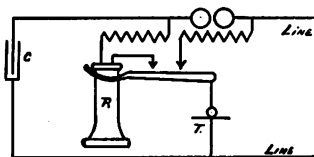
fore being replaced by a distinct species and differing form, something which cannot be said of the majority of the exchange equipment except it may be the power apparatus.

The evolution of the local to central energy or common battery is shown graphically in Fig. 5. The advent of this system, and for that matter the automatic or any new modern system, has forced upon the telephone engineers the desirability and necessity for superior workmanship and better material in all the subsidiary departments. This was primarily caused by the increase in voltage. Today poor insulation, good enough for magneto systems, will not stand the fifty volts now used in automatic work and in many instances will not even stay up in the twenty-four and forty volt systems; hence the evolution of the exchange has caused a corresponding evolution in the outside plant so that from a system having the minimum amount of cable in use we are now reaching out for the maximum amount of cable, or all-cable plant. We know the first cost is greater, but we also now know that the depreciation and maintenance are much less, and a consideration of this makes the profit on a plant not a thing of the first three or four years, as heretofore, but good for at least ten years. The same applies to all the installation departments of the work. Metallic circuits are now an absolute necessity because of the extraneous conditions, and the increase in high tension lines throughout the cities, towns and counties of our land. Again the central energy or automatic systems preclude the allowance of even low insulation on our lines, let alone the partial grounds we used to wink at under the old regime. The introduction of the multiple board made it possible for the operator to connect with any subscriber on the

entire system, and the principle of such is the duplication of the spring jack of each subscriber throughout the system by placing a spring jack for each line in the exchange within the reach of each operator, so that the transferring of calls from one operator to another, as is done in what was known as the transfer system, is dispensed with; the possibility of trouble is reduced to the minimum and the location of blame for careless or poor service is rendered possible. The first boards were of the



TYPICAL LOCAL BAT. SET. FIG. 5.



CENT. ENERGY SET FIG. 5.

"Series type;" that is, each multiple jack was connected up in series with the other and terminated in the answering jack, only one wire being used. This had defects, too numerous to mention, and hence necessity demanded the introduction of the bridged jack with the metallic line (two wires), which eliminated all of these defects, the difference being readily seen in Figs. 3 and 4. The principle objection to the series jack (which was much cheaper) was "cut outs," caused by dirty contacts, and the possibility of the operator's plug being inserted too far on making the busy test, which opened the subscriber's line. The bridged multiple jack entirely eliminates all these objectionable features. The principal feature of the multiple board, and the one which made its introduction rapid, was its solution of the question of reaching all subscribers' lines quickly and in this regard it possesses an advantage over all other types.

The automatic systems are built along different lines and are in reality huge automatic transfer systems. In such a system trunk circuits have to be provided by

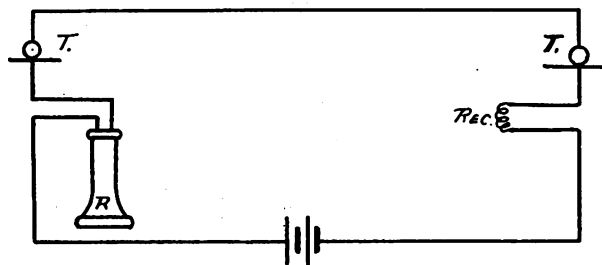


FIG 6.

which a connection may be extended from one switch-board or section to another. The means of extending these (in all transfer types, of which the Strowger automatic is one) is very simple, but in the case of the manual is subject to mistakes by the operator, whereas in the automatic this is not likely to occur. Again, in the manual it takes much longer to complete a connection than in the automatic, which is almost instantaneous, hence



the manual multiple board, while superior to the manual transfer, is not superior to the automatic transfer at least in this regard. It is an open question whether the automatic of the future should or should not be full central energy. Each side has a host of advocates and the end is not yet. The solution of the problem, as the writer sees it, lies in whether or not full central energy can or can not give as good or better service (talking efficiency) on toll line work as the local battery does, its efficiency being generally admitted. I regret to have to say that my experience makes me very much in favor of local battery where much long distance work has to be done, provided the local battery is kept up to a high degree of efficiency. An exchange equipped with cen-

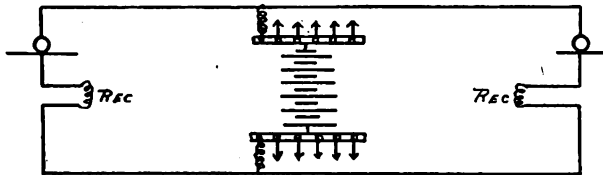


Fig. 7.

tralized battery, as in full central energy, is so arranged as to supply battery for both signaling central office and for talking purposes. This signaling is done automatically by the act of the subscriber taking down his receiver, which act may either throw a target or light a lamp.

In regard to the cost of batteries at sub-stations, in view of the fact that dry batteries can now be had at eight or nine cents apiece in large quantities, and the fact that after several months' use in the telephone (with proper care) at least ninety per cent of them can be sold to "bell hangers" and others at ten cents a piece, this expense is practically eliminated. Where this system is used (on the Pacific coast and other points) the batteries are usually discarded after they have failed to pass an efficiency test of 75 per cent of their original output; hence not only does this eliminate the cost feature but also maintains the efficiency at a high standard. In this regard it is also well to consider the cost of maintaining the centralized battery and the extra maintenance involved. There is and can be no objection made to the central energy calling, as this is certainly desirable both from the standpoint of the subscriber and of the company. The present forms of practical automatic telephones are based on central energy calling and local battery talking, which is preferred on account of reasons already given.

In the matter of line circuits we have three distinct systems, beginning with the grounded, then the common return and finally the metallic circuit, which is the present practice. The grounded circuit represented one wire only between points, with the earth as the return side. The common return substituted a copper wire for the earth and was more efficient. The metallic circuit gave each station or subscriber his own return wire which of course meant two wires and very materially increased the first cost and maintenance of telephone plant, but from the subscriber's view point marked a wonderful improvement over the other forms. Central energy equipment gives quicker service than magneto and an operator is enabled to supervise and handle more subscribers' lines, almost two to one, than in magneto systems. The constant presence of current in cables in full central energy systems has a dampening effect on the voice currents on

other wires in same cable and hence interferes with the efficient talking of subscribers.

At the sub-station a means has to be provided for keeping the current from passing through the telephone (at least enough of it to throw signal at central) and two methods are now used:—(1) Condensers. (2) high resistance coils. The former are the most efficient, but under certain conditions, for example in party lines, cannot be used; hence the necessity for using high resistance coils, the leakage on such being represented by voltage supplied divided by resistance of coils gives the current consumed, and while this may be very small when one line is used, perhaps as low as .004 amp., yet this multiplied by 1000 lines means quite a loss and, being practically constant, soon begins to show on the wear and tear of the batteries. Hence the number of such lines should be kept down to a minimum. In common battery systems each pair of cord circuits (and these practically represent lines when connected) are dependent upon the battery at central for the operation of the transmitter at the subscribers' stations when connected.

It is obvious that if only two instruments are connected the battery may be supplied to the telephone direct, as in Fig. 6, but where more than two are connected and using the same source of power then some provision must be made to keep down cross talk between

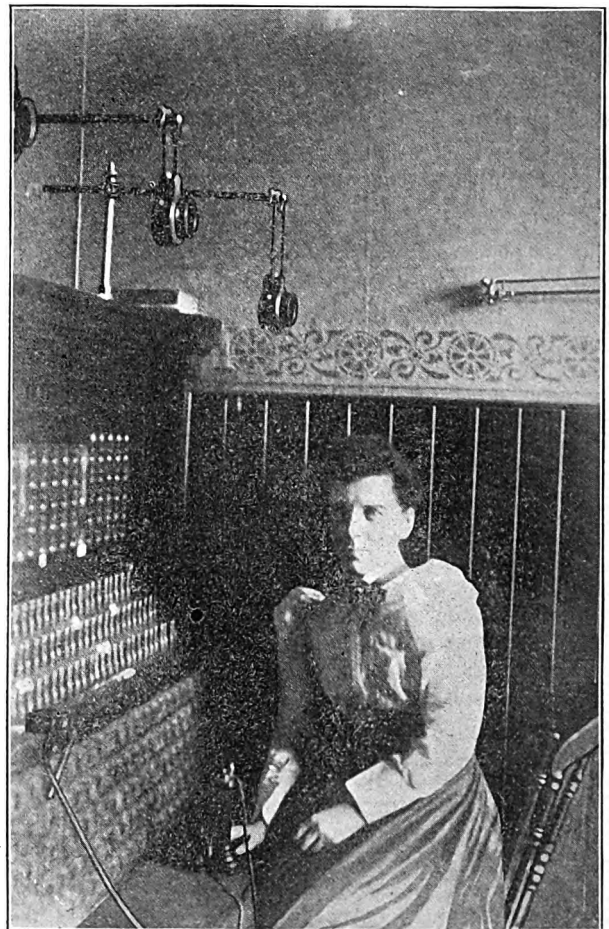


FIG. 8.—TYPICAL SINGLE PLUG EXCHANGE (NOW OBSOLETE) AT GLASGOW, SCOTLAND, 1891

the parties talking. This is done by introducing resistance or rather retardation between the source of supply and the circuit taps, as shown in Fig. 7. Such resistance, if made in the form of non-inductive resistance, will not

allow of sufficient battery passing out to the line to give good talking efficiency, for the reason that the resistance would have to be high. By introducing retardation; for example, a coil having a soft iron core, the resistance may be decreased and the efficiency increased.

Coils of this character are called retardation or impedance coils and permit the uniform distribution of the

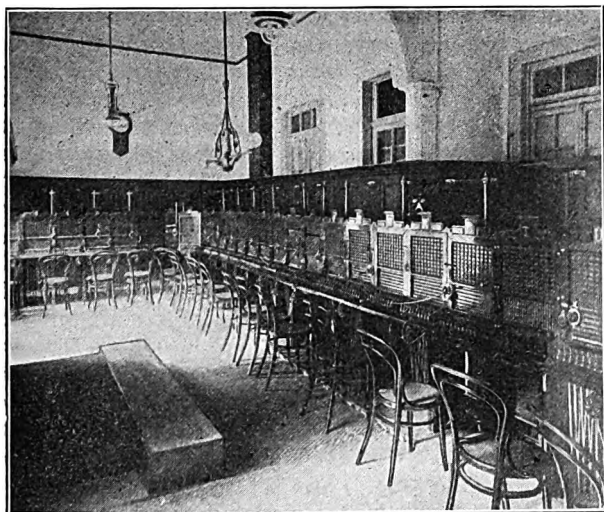


FIG. 9.—TYPICAL TRANSFER 100 LINE UNIT BOARD, SANTIAGO, CHILE, 1889.

current to the cord circuits, at the same time preventing the voice currents from other cords passing over and into each other. This, together with the use of accumulators, forms the basis of all common battery systems. In many such the retardation coil is also used at the substation to regulate and control the supply of current to the transmitter, as is shown in Fig. 5. The balancing up of long and short lines is often done by using a split or double wound coil, one coil of which is connected to each circuit; or what is frequently called a repeating coil may be used, as in the older Bell systems. Later systems have sought to find a use for this coil and formed it into a relay for supervision purposes. In the repeating coil systems, on account of the low impedance, the resistance of the circuits had to be kept down to a very low point, hence the use of large bus bars became necessary, which are dispensed with entirely in later systems. All bus bars necessary on the latest systems are those located at the fuse points on the power board where the circuits separate to their respective positions, each provided with a suitable fuse for emergency, such as short circuit, etc. The use of capacity in conjunction with retardation can be made to advantage and is frequently adopted in the design of cord circuits, capacity being almost the opposite in effect to impedance.

In the evolution of the central office the busy test was probably the greatest single advance made, and without it the multiple board today would be of no commercial use. The variety of busy tests are legion and their consideration would alone form the matter for an extended article. The simple and modern "click test" does all that is required and is made possible by the fact that when a plug is introduced into a line circuit at any point in the multiple, battery or ground (according to the system), is put on the thimble or body of all the jacks of that line, so that if another operator should touch the thimble or body of a line in use at any point with the tip

of one of her plugs, battery or ground would be put in contact with the body of the jack of the line in use and the operator having her listening key open and being thus in on the circuit would hear a battery click which would be repeated each time she made the operation and indicate line busy; if the line was clear then no sound would be heard. In the old days a special circuit was provided having a separate plug battery and receiver, which of course was not only unnecessary but cumbersome and slow. The operators in those days frequently carried on the forefinger tip what was known as the "test thimble" and took the place of the plug tip, as now used, but had a separate circuit.

A form of multiple board called the canopy and consisting of a flat multiple board (instead of upright), permitting operators to work on both sides, was much used in Europe and I believe is still in use at Glasgow, Scotland, and other European centers, but did not take well in this country. In this form of switchboard the cords (which were single, one for each line) were suspended from the canopy, the manipulating keys being on a shelf forming part of the switchboard. The drops (or annunciators) were located on the canopy in line with the operator's head. The operation of such cords was a severe strain, not only on the cords but on the operators. In Glasgow this system was worked in conjunction with the "Mann" system, or improved "Law." The evolution of the power plant, has been equally important with that of the other central office equipment. From having an immense number of exchange batteries, so great and cumbersome as to prevent the possibilities of the large systems now in use, we were enabled by the introduction of the accumulator to discard them entirely. Fig. 10 shows the terminal room of a modern central energy exchange.

In another article I will take up and discuss the latest thing in telephone switching, namely, the automatic transfer system, which is now being introduced into the

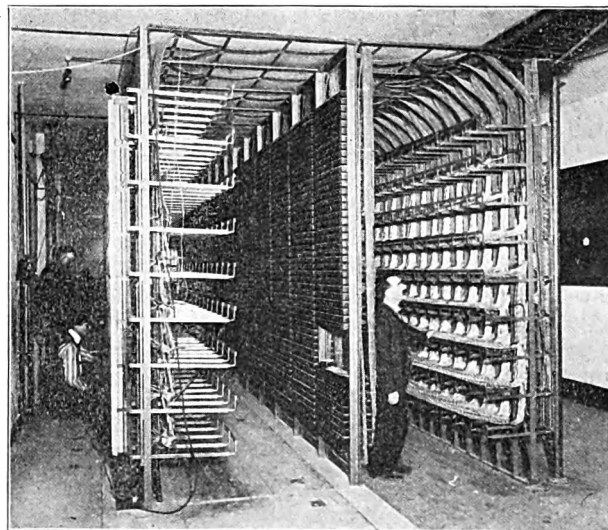


FIG. 16.—TERMINAL ROOM OF MODERN TELEPHONE EXCHANGE

larger exchanges and makes it possible and practical to put in systems of 100,000 lines at practically no greater cost per line than a 10,000 line plant on the multiple manual exchange type. We will also consider the semi-automatic switchboard.

# Time-Keeping in Telephone Exchanges

How many managers appreciate the importance of the above subject? The chances are that there is not one manager in ten that thoroughly realizes what is lost each year by not keeping track of the small losses.

One of the main necessities in the giving of good service is the discipline of the office and outside force. This especially applies to the operators and the men who take care of trouble. It is important that all the working force shall be at their places ready for work at the proper time and that they shall work their full time. It is not unreasonable that there should be some means of telling whether all employees are working their full time. As they are paid so should they work. The manager cannot always be on hand to see that everybody does his full amount of work, therefore some system of time recording



should be used. This record, if the clock is correct, is unassailable and there can be no dispute as to the amount of time put in. It is usually found that the employee who object is the one who is the most apt to cheat his employer on the time; those who are always punctual seldom object to the time record. By keeping an accurate record of the work being done, it will be surprising how much more will be accomplished per man. Take for instance in the tracing of telephone and line trouble. If the time a case of trouble is reported is recorded by the clock, the time a man is sent after it and the time it is found, there will be a full history of the case. If the man is too slow about the work, if the trouble clerk is slow to look after it and the length of time the line is out of use, all are accurately given. There are many cases where an additional employee has been avoided simply by being able to know any time of the day just what is being done.

There will always be trouble in any exchange which will throw lines out for some time. The subscriber will be apt to be very impatient and is inclined to exaggerate the time the line was out of use. If there is nothing to show for it the exchange may have to give a rebate upon the next bill. If a time record has been kept the subscriber can be shown the exact hour and minute the trouble was reported and the exact moment it was cleared.

In the average exchange the toll records as regards time are kept with a liberal hand. The rate may be twenty-five cents for a five minute conversation, but if the

patron wishes to talk ten minutes the rate is the same and he cannot be persuaded that he has talked more than the ordinary length of time. There are machines that give the exact time when the conversation is started and the time it is ended to the last second, if necessary. There is no doubt. Every minute of time is paid for and the revenue is increased very considerably. There is another side. The average toll line has a waiting list and when anybody is talking overtime without paying, other business is kept away. When a line is not busy anyhow it is all the more important to make every man pay in full for the time he talks, for unless the earning capacity is as high as possible there will be no profit on the investment.

No manager would stand it to have a person stand in front of the exchange door and keep others out, but when he allows a person to talk overtime, he allows that very same thing. This is truly a commercial age and everybody is looking after the almighty dollar. Many deplore this tendency, but the fact remains and unless the fact is recognized by those who are in business they will not be a living factor very long. The Biblical character with the one talent was probably one who deplored the modern commercial scramble after gain. He saw his finish. Just read his story.

There are machines that not only mark time but also mechanically subtract the commencing time of day from the stopping time of day and print the difference—the elapsed time, thus eliminating a large number of errors that are made when one time of day is subtracted from another time of day manually. It has been found absolutely necessary by our most successful business houses to have an accurate record of the costs of every department and in this connection the word of the employee cannot be taken, not because he is dishonest but because he does not realize the importance of being accurate.

## Nort Dakota Independent

The North Dakota Independent Telephone Company, which has recently established headquarters at Fargo, is the outgrowth of the consolidation of most of the important Independent telephone companies in the state. Its officers and directors are: H. R. Lyon, Mandan, president; Robert Jones, Fargo, vice president; J. S. Weiser, Fargo, treasurer; J. D. Brown, Hope, vice president; Alexander Hughes, M. B. Cissell, E. H. Moulton, directors; L. D. Richardson, general manager. The company began business with about 1,000 miles of toll lines and material is now on the ground for a standard copper line between Fargo and Jamestown. If the weather permits the line will be extended to Bismarck this year. The company is now operating about 25 exchanges, including Casselton, Valley City, Fessenden, Bismarck, Garrison, Paige and Hope. At Fargo the system will connect with the Tri-State lines.

The National Carbon Co., of Cleveland, Ohio, has issued its sixteenth catalogue, entitled "National Batteries." It gives excellent reproductions and will be mailed on application.

# Competition a Blessing to the Public

Kearney is one of the enterprising Independent towns of Nebraska and its telephone system, managed by Mr. W. J. Stadelman, is considered a model by the managers of adjacent exchanges.

Mr. Stadelman is a systematizer and the designer of an improved folding telephone rental and toll bill, the beauties of which cannot, unfortunately, be made clear by a reproduction. The blank, especially adapted for small exchanges, has a complete bill on one side and on the reverse a toll charge. By inserting a carbon, when filling in the rental part, a direct copy is obtained on the stub of the original. Then the leaf is turned back and the carbon inserted again for making out the itemized toll bill. The receipted bill in both cases is the original and the stub the copy. The bills are put alphabetically in a loose leaf collecting book so that there is no chance of losing the stub. Moreover, the receipt and bill are always identical. The blanks are arranged so that they can easily be filled out on a typewriter.

Kearney is famous the world over as being the most centrally located town in the United States and, through

Sheldon, chairman of the telephone committee of the Omaha city council, to prove that competition is not a "monster evil," as the Bell company puts it. Mr. Stadelman's report is so terse and convincing that we print it in full:

## TELEPHONE COMPETITION.

In 1899 the Bell Telephone Company had in Buffalo county 150 subscribers, all of these being in the county seat, Kearney. At that time there was no other exchange in the county, and there was not a mile of farmer line nor a farmer telephone here. The Bell Telephone Company made no effort whatever to give the farmer any service. In fact they seemed satisfied with a few subscribers at exorbitant rates.

There were many farmers who at that time wanted telephone connections, but were unable to secure the same on account of the disposition of the Bell Telephone Company not to furnish farmer service even at the ruinous prices.

In the same year there was organized what was known as the Home Telephone Company of Kearney, which since has been changed to Kearney Telephone Company. For the first two years of their existence no effort was made to build farmer lines on account of the great demand for telephones within the corporate limit, caused by the reduction of rates. But after these demands had been satisfied a movement was started to take care of the farmers and later I will show you the progress made.

Prior to competition the Bell Telephone Company charged \$4.00 per month for business telephone and \$3.00 for resident telephones. After competition the rate was reduced to \$2.00 for business and 75 cents for resident phone. So much for competition.

If you take the present number of Bell phones in the county, which is about 600, divided into 100 business and 500 resident, you will readily see that a saving has been made of \$24.00 a year per business phone or \$2,400 for the 100 phones. And the saving of \$27.00 a year for each resident phone would make a saving of \$13,600 per year for the 500 resident phones. The total saving to the subscribers of Buffalo county is at present \$15,900 per year.

Supposing the Bell Telephone Company had their 600 subscribers at the time the Independents came in the field, and charged for the past seven years their former non-competitive rates the people of this county would have paid \$111,300 more than they have paid. And still the Bell Telephone Company maintains that competition is a nuisance and a burden to the people. Figures are not interesting reading, but they tell the truth.

The Independents have during these short seven years of their existence given to the people of Buffalo county seven exchanges, with a total of more than 2,000 subscribers. At Kearney alone there are 17 farmer lines with 267 subscribers that have free service to the Kearney exchange of about 800 telephones which includes all of the farmer lines connected thereto, covering a radius of more than twenty miles. Elm Creek, Gibbon, Shelton, Amherst and Miller have made the same progress. Each of the towns named has a great number of farmer lines which radiate from the exchange.



STRINGING COPPER WIRE HALF WAY  
ACROSS THE CONTINENT

the courtesy of Mr. Stadelman, a picture is herewith reproduced showing the Kearney Telephone Company's copper gang stringing copper half way across the United States. The picture was taken at Watson's Ranch, Kearney, 1733 miles from Boston and 1733 miles from San Francisco.

The success of the Kearney Telephone Company is best shown by facts and figures submitted to Hon. W. S.



In making a comparison of the actual saving of dollars and cents, as we find conditions today under competition, you will note that providing a patron has both telephones in his place of business, and also in his residence, he would be paying to the two companies only \$5.75 per month for telephone service with 2,600 subscribers and prior to competition he paid \$7.00 per month for service with only 150 subscribers. The actual saving of \$1.25 per month per subscriber for 2,600 subscribers means a \$3,250 monthly saving; or a total yearly saving

of \$39,000, with 17 1-3 times the number of people to talk to; and everybody, even including the Bell people, will admit that the value of telephone service is based on the number of subscribers that can be reached.

These figures should prove conclusively that the so-called dual system is a great money saver and a benefit to the public instead of a nuisance, as the Bell Telephone Company chooses to term it. I find that about the same conditions as these exist in all the other counties in the state where there is telephone competition.

## Managerial Co-Operation

Many Independent companies fall down because the management does not give adequate support to its solicitors. In these days of strenuous competition, when the Independents are "up against" the perfected soliciting methods of the Bell company, nothing must be left undone to attract the attention of the public to the advantages of Independent service.

The Bell company's agents invariably endeavor to impress upon the public mind that no other telephone organization has as efficient apparatus as that supplied by the monopoly. In hundreds of instances the people are deceived and the solicitors of the Independents are very often not well enough informed to straighten out the misrepresentations of their competitors.

Right here managerial assistance comes in as a powerful factor and business winner. The manager, who is familiar with the equipment of his line, can explain by letter just what kind of service his company is offering. In nine cases out of ten it is better than the Bell service.

Mr. H. H. Bratt, the efficient manager of the Union Electric Telephone and Telegraph Company, which operates in Davenport, Rock Island and Moline, keeps track of the follow-up work the card system has been. Daily reports are made by the solicitors and literature sent to all the persons interviewed by them. To keep track of the follow-up work the card system has been adapted, the following being a sample of the card used:

Name.....

Address.....

LITERATURE SENT.						SPECIAL LETTER.					
1		4		7		1		4			
2		5		8		2		5			
3		6		9		3		6			

Solicited ..... Date.....

By whom.....

.....

.....

This card provides, as will be seen, for nine sets of literature and six special letters. The complete set has rarely failed to make a customer.

One of the business-getting letters used by Mr. Bratt

is given herewith, because it is a fair sample of the good literature issued under his direction:

We may appear persistent in again urging your consideration of becoming one of our subscribers, but we are so well assured of the merits of our service, that we feel warranted in claiming your attention.

Others are profiting by using one of our phones, and we want you to realize that we are offering something of advantage and benefit to you.

We offer a better class of telephone service than Davenport has ever before enjoyed. Our advent has reduced the cost of single Metallic Telephone Service to that of the original party line rate. We have demonstrated that first class service can be given at reasonable rates. The most striking example being our Professional Business rate of \$30.00 a year for an individual metallic line, which should interest all Professional men.

Our rates per year with Unlimited Tri-City and County Services are as follows:

Business Private Metallic Line.....	\$36.00
Business Two Party Line.....	25.00
Business Four Party Line.....	20.00
Residence Private Metallic Line.....	18.00
Residence Two Party Line.....	15.00
Residence Four Party Line.....	12.00

If these rates do not warrant you in sending us your order, they ought at least to set you thinking about it, and we trust we may be favored at the proper time. Inquiries solicited.

### Independent Victory at Omaha.

An ordinance granting to the Home Telephone Company a franchise for the term of 35 years was passed by the Omaha council, with a provision that the proposition be submitted to the voters at a special election to be held November 6, 1906.

The ordinance provides that the company shall not charge more than \$1 per month for an individual line, unlimited incoming service, nor more than 2 cents for each outgoing city call. Unlimited incoming service for individual residence line to cost not more than 50 cents per month, with a charge of 2 cents for each outgoing city call. The company must establish an exchange in South Omaha and connect the same with the Omaha system without toll charge. A system with a capacity of 15,000 phones must be constructed within 2 years, and for the purpose of securing compliance with the various provisions of the ordinance the company must deposit \$25,000 with the city. Section 7 prevents the company from selling its franchise to any competing company. Section 9 provides that the city may purchase the property of the company at any time after 25 years, or any time thereafter, for the value of the physical property alone.

Section 10 states that the ordinance shall be void unless approved by the electors of the city at a special election on November 6, the cost of which election, estimated at \$2,500, must be defrayed by the company.

# Placing Properties on a Paying Basis

By DWIGHT E. SAPP

At the last meeting of the Ohio State Association Mr. Dwight E. Sapp, of Mt. Vernon, O., made some remarks on the "Development of New Territory and Importance of Placing Properties on a Dividend-Paying Basis."

The arguments made by Mr. Sapp may not meet with the approval of all telephone organizers, but they are certainly worthy of the most thoughtful consideration and we, therefore, take great pleasure in presenting them in full:

I have no royal receipt or method for producing these remarkable results: "Development of New Territory and Importance of Placing Properties on a Dividend Paying Basis." If I had I certainly should copyright it. As I understand this subject, I shall have accomplished the purpose of my appointment if I am able to suggest some points that will provoke a discussion from other gentlemen present, and that will bring out an expression of views as to the subject-matter of this discussion, namely, "The development of new territory, and the importance of placing properties on a dividend paying basis." In reading over the subject this morning I found some difficulty in comprehending exactly the scope which the discussion might take. "The development of new territory." This pre-supposes, probably, for the purposes of discussion, that an individual company has particular territory, and the question with it is one of expediency as to the extent of development of that territory; whether the county, as in many cases throughout the state, shall be the basis of development and the unit, we may say, or whether the company shall confine its development to the city or other community in which it originates. I shall pursue what I am about to say with the view of existing discussion. My personal experience has been that uniform development is the essential thing; development co-extensive with reasonable territorial limits. We have found it most satisfactory not to bite off more in the way of development than we can chew. Having, for example, occupied the county, we form as the hub of development the county-seat of that county, and from that point our system radiates to every other point in the county that is susceptible of development, and each of these points is developed in harmony with the principal system which is located at the county-seat. Our policy has been, and with excellent results, to occupy a reasonably large territory and develop it thoroughly. We have constantly before us while we have been engaged in the telephone business the necessity for developing new territory; a necessity that doesn't originate with us, but that is created by the needs of the people whom we seek to serve. We have met that necessity, or have undertaken to meet it, and are supplying, wherever we are engaged in business, service within the limits I have undertaken to outline, as rapidly as possible. We have not, in many instances, waited until the demand has been made, but we have anticipated it. Briefly, we develop the territory we occupy as rapidly as we can, and that brings me to the other feature of the discussion.

In developing territory attention is, of course, required to some very important considerations. We have not found it possible to develop territory upon wind. We have found that for every telephone we install money is required. Unfortunately, we haven't all that we require

and we are obliged to associate others with us. How shall we create such an interest locally as will enable us to carry out this scheme of development I have suggested and secure local influence and financial support? There is one peculiar thing about the Independent telephone development in the state. A company originates in a county, "A" for example. Its support is purely local, the market for the sale of its securities is necessarily narrow, and if securities are offered for sale, in ninety per cent of the cases, they must be offered in a community where, if money seeks an investment, it must be one which will offer immediate returns.

In Col. Dickson's city, for example, there is a class of investors who buy securities with the expectation, not of having an immediate dividend but at a figure below par that will bring their returns as the market value of the securities purchased increases. With us, however, and in the smaller places, securities must be marketed within a community and sold to a class of people who expect immediate and direct returns. A false policy has been pursued in many instances by those who originate a company and seek to confine its stockholders to their own number; seek to utilize the surplus earnings—and these have always been present in properly managed telephone companies: to pay for such extension as these earnings will cover instead of, as has been very properly done in some cases, capitalizing the new business that is presented, and thereby avoid the effort which is made to make the property, out of its earnings, pay for the new business. We have found that to be inexpedient,—to be unbusiness like. We have found it expedient, I repeat, to increase our membership, to increase the number of stockholders and allow others to share with us in the profits arising from new development; and in creating a sentiment of the sort that will induce local investment in our securities, we have put these properties upon a dividend paying basis. Our dividends are paid regularly—as regularly as government bond coupons are upon presentation. We make the properties pay dividends; they are capitalized on a basis that will enable them to pay dividends. The result is that when we require additional money for new construction we have created a market for the sale of our securities, and they are constantly in demand. There isn't a company in which we are interested that does not find a ready and immediate market for the securities the company may have to dispose of, and it is for the reason I have stated; because the investor, even if he buys in the middle of a quarter, receives his proportion of the dividend for that quarter, beginning with the issue of his stock and ending with the quarter. These dividends we have made uniform: we don't pay six per cent one year and twelve another and pass the dividend the next year. We pay a fair dividend, indeed an inviting dividend, and we carry whatever surplus earnings remain, after operating expenses have been provided for, to a surplus account. We have found it expedient, up until now, to use this surplus for additional construction, but any intelligent stockholder appreciates that money so used, and properly used for construction, increases the value of his stock holdings. So it is that pursuing these methods we have found a good and growing, and a constant demand for securities locally; a demand that would not otherwise

have existed; a demand which, I say, we have created by pursuing this policy.

As I started out to say, gentlemen, I feel that I shall have performed the purpose of my appointment if I shall suggest some ideas for discussion, and as I understand I am to be followed in what I say by other gentlemen here who will express their views, along these same lines, I will not go further into detail. The subject is an important one. I do not know to what extent a policy contrary to the one I have outlined has been pursued. We have pursued it, and by pursuing it we have created a local demand for our securities, and to-day in each of the places where we are operating, if we were not selling treasury stock to take care of new business, if that treasury stock was not competing with the stock held by the individual stockholder, there isn't a place where the stock would not be bringing a handsome premium. A year hence in all of these places stock that is now selling at par will bring at least 130. That excellent result exists in many places and will exist with us and in the places where we are interested as soon as the competition afforded by the sale of treasury stock has been brought to an end.

#### Telephone Progress in Italy.

Consul Paul Nash, of Venice, reports that the telephone service in Italy, both urban and intercommunal, has hitherto been almost entirely in the hands of two great companies—the Societa Alta Italia, operating in Milan, Genoa and Turin, and the Societa Generale Italiana dei Telefoni ed Applicazioni Elettriche, controlling Bologna, Florence, Rome, Naples and the Sicilian towns.

In the beginning of 1904 the ministry of posts and telegraphs took over the Venice telephone system, extending the service, raising the pay of the employees, and reducing the rates, but, in spite of increased expenses, putting aside some \$12,000 a year toward a fund for the changing of the entire system. The time has now come when bids for this change are being made, and already three have been received—one from an American, one from a French, and one from a German firm. These bids are yet to be submitted to the ministry at Rome by the local director, and there is still time for other American firms to compete if they act promptly.

The ministry of posts and telegraphs recently appointed a commission to investigate the telephone service throughout the country, with the result that in many places a complete change was found to be necessary. In Rome, for example, the service was found to be extremely bad, and that town will probably be one of the first to be modernized in this respect. The appointment of this commission was the first step in the project of the ministry to take over control of the telephone service of the whole country. Thus the moment seems most propitious for investigation by our manufacturers, and because the government will undoubtedly prefer a uniform system throughout Italy an immense business might possibly be the reward of the successful bidder for the modernization of the service in the first large towns in which it is undertaken under government control.

The director of the local exchange tells me that the American system known as the "batteria centrale," which I understand to be that in which miniature electric lights are used in the switchboard instead of the antiquated drop indicator, and the concentration of the batteries at one

point is in use at Milan, and that as it gives perfect satisfaction the tendency will be to adopt it generally. He also says that of the three propositions already submitted to him for the new exchange in Venice that of the American firm seemed to be the best, and that although the actual choice does not rest with him he believes the minister will award the contract to this firm, provided, of course, nothing better is forthcoming.

American desk telephones should find a ready sale in Italy. The only thing of the kind in use in Venice is a French production known as the Bailleaux-Ader which, although excellent as far as mechanism is concerned, is inclosed in a large wooden box, and is too heavy and cumbersome for conveyance. It has, however, one good feature—the combination of the transmitter and the receiver on one handle. This is said to maintain the lips at the proper distance from the transmitter, besides having the advantage of leaving one hand entirely free.

#### Canada Wants More Privileges.

The Union of Canadian Municipalities, which recently met at Halifax, devoted a day to the discussion of the telephone situation in the Dominion. Various reform measures to curb the rapacity of the Bell company were suggested by Mayor Coatsworth, of Toronto, and Alderman L. A. Laposite, of Montreal.

A resolution was adopted to the effect that when a telephone company already charges its maximum authorized rate to its subscribers, being under obligation to supply the best and most modern equipment, it is unjust and illegal for the company to make an additional charge under the pretense of supplying an improved instrument called a long-distance telephone.

Another resolution endorses the request of the legislature of Manitoba to the Dominion parliament for authority to expropriate or purchase all the telephone lines in the province and affirms the principle that similar authority be given to the other provinces of the Dominion.

A third resolution advocates that the Dominion parliament be memorialized to amend the legislation of the last session so as to require the freest interchange of business between telephone companies, whether long-distance or local.

#### State Line Company Versus Bell.

G. J. Newton, one of the country's noted telephone engineers, has recently completed plans for the conduit system in Tarrytown, Ossining, White Plains, Mt. Vernon, New Rochelle and several smaller places and is now working on the system for Yonkers. These places are all in Westchester county and within 30 miles of New York City. D. A. Reynolds, vice-president and manager of the State Line Telephone Company, intends to push the work in this district as rapidly as possible. The company has recently made application for permission to use the conduit system of the Empire Subway Company in New York, which move has aroused the opposition of the Bell company whose managers are just beginning to realize that they have to prepare for a fight. In all the smaller towns near New York they have large gangs at work making new block distribution so as to be in a position to give prompt connection, if driven into a corner. Certain it is that the State Line people are giving the monopoly crowd a run for the money.

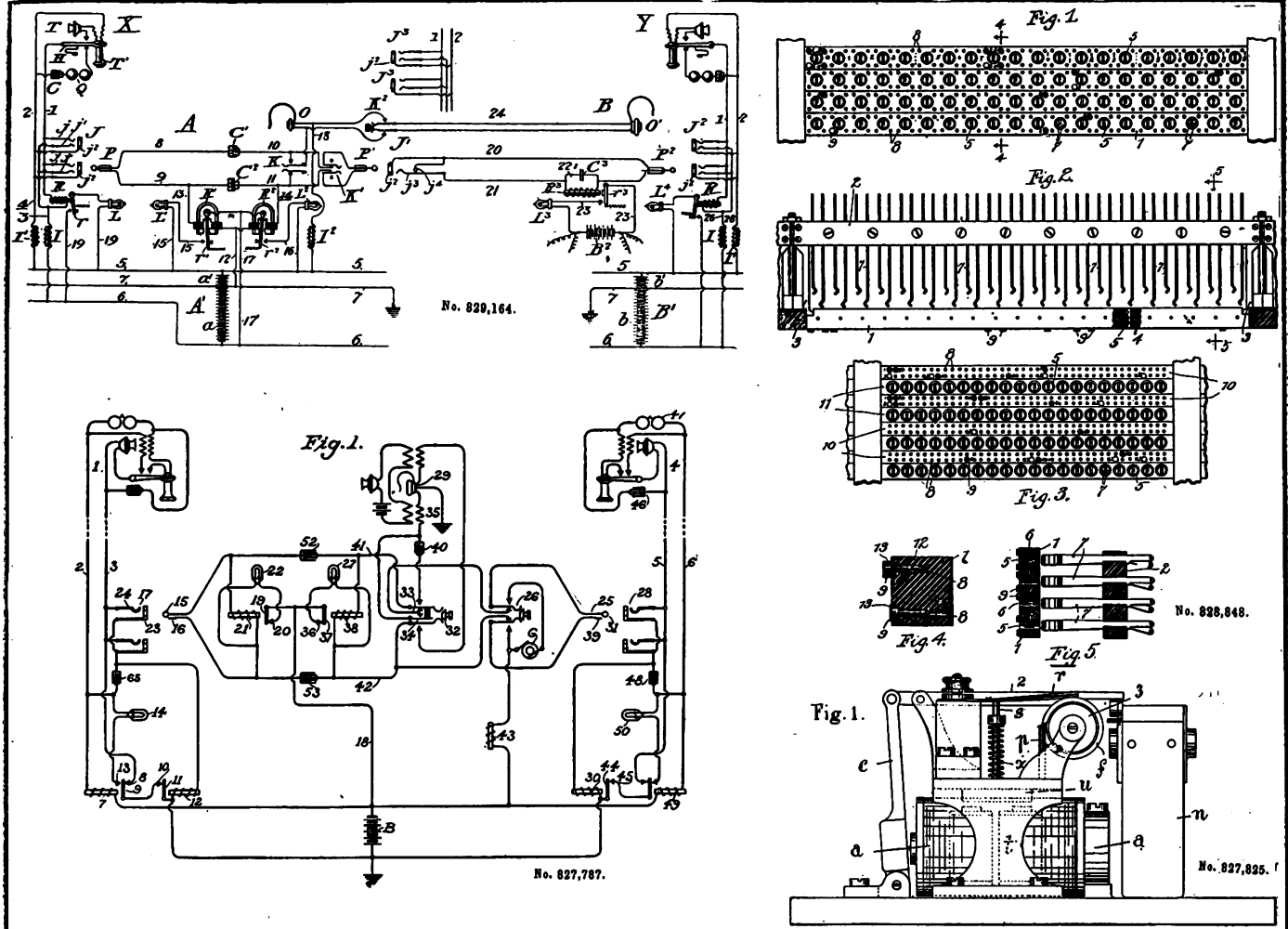
# Recent Telephone Patents

ELMER R. CORWIN, of Chicago, Ill., assignor to Monarch Telephone Mfg. Co., of Chicago, Ill., a Telephone System, Patent No. 827,787, Aug. 7, 1906.

This invention relates to that class of telephone systems in which signals are set before the operators at a manual switchboard by the removal of the receiver of the subscriber's telephone from its hook, energy being thus supplied to the line for all purposes of signaling and speech transmission from a source in the central office,

test circuit being adapted to be completed when the substation-telephone circuit is open through the signal device and one of the said two conductors of said plug-circuit, and adapted to be completed when the substation-telephone circuit is closed through the line-relay, the telephone-line and substation-telephone and the circuits associated with said plug.

ALEXANDER M. HAUBRICH, of Chicago, Ill., Assignor to the Stromberg-Carlson Telephone Mfg. Co.,



and in which the line, if desired, may be terminated in a plurality of line-jacks in a multiple switchboard at the central office.

It consists of telephone-lines with multiple jacks, the combination of a telephone-line and substation-telephone, multiple jacks connected with said telephone-line, test-rings forming parts of said multiple jacks, a cut-off relay, circuits from the said test-rings through the said cut-off relay, a line-relay, a plug adapted to connect with any one of said multiple jacks, a plug-circuit of two conductors connected to said plug, a bridged supervisory relay and a signal device, and a busy-test circuit when said plug is inserted into any one of said multiple jacks, a portion of said busy-test circuit being at all times formed by the circuit from the test-rings of said multiple jacks to and through the cut-off relay, said busy-

test circuit being adapted to be completed when the substation-telephone circuit is open through the signal device and one of the said two conductors of said plug-circuit, and adapted to be completed when the substation-telephone circuit is closed through the line-relay, the telephone-line and substation-telephone and the circuits associated with said plug.

ALEXANDER M. HAUBRICH, of Chicago, Ill., Assignor to the Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y., Telephone-Switchboard, Patent No. 828,848, Aug. 14, 1906.

This invention relates to telephone-switchboards; and its object is to provide means for at all times indicating to the central-exchange attendants the condition of the telephone-lines or the substations and instruments connected therewith.

Heretofore when a calling subscriber requested a connection with another subscriber in order to ascertain whether or not the called subscriber could be obtained it was necessary for the operator to insert a calling-plug into the called line, then to ring over the line, and then to watch for the supervisory signal to indicate whether or not the called subscriber had answered. If the instrument at the substation was defective and unserviceable, or if for any other reason the desired subscriber



could not be reached a great loss of time resulted both to the operator and the calling subscriber.]

This invention obviates this loss of time, and it provides indicating means whereby the operator may at a glance ascertain whether or not the called subscriber is obtainable, and if the called subscriber cannot be reached she can at once notify the calling subscriber thereof. For this purpose I provide pins having different-colored heads adapted for insertion, preferably about or in close proximity to the line-jacks, each color corresponding to a certain operative condition of the line or substation or instrument connected with a line, thus being very useful in connection with party-lines to indicate the condition of each substation or instrument connected with a party-line.

JACOB W. LATTIG, of Wyncote, and CHARLES L. GOODRUM, of Philadelphia, Pa., Assignors to Eastern Telephone Mfg. Co., of West Chester, Pa., Telephone Trunking System, Patent No. 829,164, Aug. 21, 1906.

This invention relates to telephone-exchange systems, and more particularly to such systems as employ a common battery or batteries located at each central office for the purpose of signaling to and from the exchange. It has for its object the provision of means whereby the trunk connections between different portions of the same exchange or between different exchanges may be more perfectly controlled and the work more easily and certainly accomplished than heretofore.

It comprises two central stations, a common battery at each station having end terminals and a grounded intermediate terminal, subscribers' line fed from said batteries, a trunk-line interconnecting the stations and a cord-circuit at one station for interconnecting the lines thereat with each other or with the trunk-line, means at the other station to interconnect the trunk-line with the subscribers' lines thereat so arranged as to connect the component line-wires at the two central stations in the same order as when interconnected directly at either station, a supervisory-signal device connected between the intermediate battery-terminal and one side of the cord-circuit at the first station, and means at the subscribers' stations to maintain their line-circuits closed during the use of their apparatus, whereby the supervisory-signal device will become energized by current from one side or division of one or the other main battery when a direct connection is made or when a trunk connection is completed, and will be de-energized when the called subscriber answers, in either case.

HARRY BENWELL STOCKS, of Manchester, England, Party-Line System of Telephones, Patent No. 827,825, Aug. 7, 1906.

This invention has for its object the provision of switching apparatus at subscribers' instruments (or other suitable position on the line-wires of a party-line system) which shall be capable of operation by the person in charge of the line at the switchboard in the exchange, and at the same time said switching apparatus shall not be under the control, directly or indirectly, of the subscriber unless it is desired that it be so arranged, and at the completion of a call provision is made whereby all switches return to zero position, so that perfect synchronism of the movements of all switch apparatus is assured.

It consists of a switch-box for subscribers' instruments, consisting of an electromagnet or the like, an armature influenced by such electromagnet, a drum having contacts thereon, a ratchet-wheel secured to such drum,

a pawl actuated by the armature to rotate the ratchet-wheel and drum by impulses through the electro-magnet, a spring coiled by the rotation of the drum, a brush for zero position, a spring-actuated plunger for normally holding the brush for zero position, out of contact with the zero contact magnet to attract the armature and bring the brush on the zero contact, brushes for speaking contacts on the drum, and a magnet of the polarized type, the pawl and a locking-detent from the ratchet-wheel on a reversal of current being sent through the polarized magnet the springs returning all the drums in the party-line system to zero.

#### Yankton Independent Expands.

The Independent Telephone Company of Yankton, S. D., at a recent special meeting of the stockholders voted to amend its articles of incorporation increasing its capital stock to \$500,000 and providing for the issue of same in two classes, preferred, class A, to consist of \$300,000 of 7 per cent annual dividend stock upon which the dividend must be paid before any dividend can be paid upon the common stock. The common stock, class B, to consist of \$200,000 which will be entitled to all earnings of the company after the payment of the preferred 7 per cent dividend on the preferred stock.

The property and system at the present time of the company consists of 175 miles of long distance lines; 200 miles of farm rural lines and six local exchanges. The town exchanges and rural lines owned by the company are those of Tabor, Lesterville, Utica, Mission Hill, Gayville and 18 lines out of Yankton.

The long distance lines of the company now consist of the lines west from Yankton to Utica, Lesterville, Tabor and Tyndall, connecting at Tyndall with the lines of the Missouri River Telephone Company, reaching Avon, Wagner, Lake Andes, Armour, Mitchell, Geddes, Platt, Bonesteel, Chamberlain and the reservation towns; the lines north to Volin, Irene, Viborg, Hurley, Davis, Lennox and Sioux Falls, with connection of the lines and exchanges of the Citizens' Company and of the Twin City System, and east with the new copper line to Sioux City, connecting with the Citizens' Automatic Exchange, and the copper toll line system of the New State Company through Iowa and Nebraska and reaching over 3,000 cities and towns.

#### The Telephone in Harvest Time.

It is reported by one of the Kansas City newspapers that Mr. J. A. Frambers, of Oxford, has put the telephone to a new and novel use. Summer County is covered with a network of rural telephones; all told, there are more than 3,000 telephones in the county. Mr. Frambers kept his threshing outfit in constant communication with these telephones. He is a member of the Oxford Mutual Company, and has had a telephone installed in his cook shack. Whenever Mr. Frambers moves his threshing outfit to a farmer's premises his cook shack telephone is immediately connected with the telephone wire running along the highway, and no matter how far out in the country he may be Mr. Frambers and his cook are in constant communication with the grocers, butchers and other supply houses. Mr. Frambers can also call up almost any farmer in the county to talk threshing to him, and the "next" man on Mr. Frambers' list can, simply by using the telephone in his home, learn just when the threshermen will arrive at his place.

# A Victim of Switch-Room Discipline

By MISS T. BARNES

NOTE—The operators of the Inter-State Telephone Company are not allowed to hold any communication whatever with the subscriber, outside of their regular duties. For information of any kind they are referred to the chief operator or Information. If a subscriber asks for an operator, or for an operator's name, he is put on the chief operator's desk, with no explanation for so doing by the operator. The subscriber must either leave his message or wait until operator is off duty.

The following relates the vain attempt of a young man who desired to have a word over the telephone with his sweetheart, an operator employed by the Inter-State Telephone Company at Springfield, Ill.:

"Number, please?"

"May I speak to Mary?"

Chief Operator—"Whom do you want, please?"

"Oh! er—ah—say—Chief, can you tell me what the population of the Philippines is?"

The chief operator is asked many miscellaneous questions during the day, but did not happen to have the figures of this particular question on the tip of her tongue. She rather knew anyway what the young man wanted before the call reached her desk, from what she had heard on the monitor. She gave him some figures which sounded all right, knowing he was not deeply concerned about the population of the Philippines. He thanked her kindly and said she was "very accommodating." He swore softly as he hung up the receiver.

"They are on to me at this telephone," thought he. "I'll borrow the use of the one in the next block. I am in a deuce of a hurry, too. I will have a telephone put in my room and then I hope they will not sidetrack me on to the chief operator when I want to talk to Mary."

He hurried down to the next block and asked the use of the telephone. He took the receiver stealthily off the hook.

"Number, please," said the operator sweetly.

"Central—listen—put Mary on the line, quick, I want to tell her something."

Chief Operator—"Whom do you want, please?"

"Er—Mary, or I mean, chief operator, can you tell me how much territory the San Francisco fire covered, please?"

"I thank you."

"Foiled again," he growled as he hung the receiver up in such a vicious manner that he looked for all the world as if he were trying to knock some one down with it.

"Those girls are jealous of Mary. I suppose they there is a good show in town tonight, and they tell the chief operator I am calling Mary. Let me see. What shall I do next? I must get back to the store or run the risk of being discharged for being late. Well! I am going to talk to Mary. If Fred talks to her first, I may have to go alone to the show and occupy two seats at two dollars apiece. Confound it! I'll go in here and try what a little jollying will do. Perhaps I can get Mary on the line with a little coaxing."

"Number, please," as only the Inter-State operator can say it.

"Miss Central, are you as sweet and pretty as your voice?"

Chief Operator—"Whom do you want, please?"

"Let me see—just a minute." He snatched the telephone directory off the hook, turned the pages wildly

until he came to the "directions for using the telephone, information given, etc." He glanced down the page to see what question he could ask so as to throw her off the track about Mary.

"What's the weather forecast?"

"It is raining," she replies sweetly.

"Hang the luck! Why didn't I ask her to call me at 6 o'clock," he grumbled as he hung up the receiver, forgetting his accustomed courtesy, and with such a look of hopelessness and dismay on his face that the proprietor asked him "if he had just received bad news."

He tried several times during the day with no better success. He finally decided to go over in the evening and ask her. He rang the door bell at seven and her mother answered the bell, saying: "Come in. Mary will be ready soon."

"Ready for whom?" thought he.

He heard a light flutter and saw her standing in the doorway.

"You! Oh! I forgot to tell mother whom I was expecting."

"Mary, I have been trying to get you all day to ask you to go to the show tonight."

"Were you? One of the operators recognized your voice today and she was telling me how nice you tried to be to her. And the chief operator told me this evening that my friend must be gathering information for an encyclopedia. So I called up Fred when I got home this evening and asked him if he had heard about you leaving Robinson's. He said he wasn't sure, but he saw you on the street several times during the day so he thought it might be true. There's the door bell. You must excuse me. I am going to the theater."

"No wedding bells for me," he sighed as he handed out half a week's wages in opera tickets to a newsboy and trod wearily home.

## Metal Poles for Telephone Lines.

Various railroad companies throughout the southern states and Mexico are making experiments with metal telegraph and telephone poles which, in semi-tropical climates, they believe, will prove a decided improvement as far as durability is concerned. The difference in cost between metal and wood, it is claimed, will be more than made up by the additional life of the former. A line of metal poles, properly treated, would be practically permanent and require but little expense for repairs. Scarcity of timber suitable for poles is making its purchase prohibitive in many sections of the country.

## Giraffes Pull Down Wires.

Telegraph lines in Africa are exposed to unusual perils, and interruptions are of an extraordinary character. Recently, according to the Bulawayo Chronicle, a herd of giraffes became entangled by their necks in the wires at Intundhia, 125 miles from Bulawayo, and pulled about a mile of wire down, breaking three of the iron poles. The telegraph lineman was near at hand, and communication was interrupted only for a few hours. This is the sixth time since the opening of the Falls Line that similar interruptions have occurred. In two cases elephants were responsible.

## New Telephone Building at Paris, Illinois

It has now been just about a year since the Kinloch Company took over a controlling interest in the Wabash Valley Telephone Company at Paris, Illinois, and began the work of putting it upon a basis which would insure the highest efficiency of service, through an equipment thoroughly modern in every detail. When the new plant, now approaching completion, is in work-

the plant, has been erected with an eye single to making it an ideal structure for this purpose. It is two stories high, built of brick with stone trimmings, and is as thoroughly fireproof as it was possible to make it. In this respect, as well as in general excellence of construction, it is worthy of rank as one of the very best buildings of its kind.



NEW EXCHANGE OF WABASH VALLEY TELEPHONE CO., PARIS, ILL.

ing order, it will be operated wholly upon an Independent basis, using its own instruments and toll lines. No pains or expense has been spared to make the new plant as good as money and skill can produce. Throughout the business section the wires have all been placed underground, and elsewhere in the city, so far as practicable, cables have been substituted for the open wires, thus obviating to a very large degree the annoyance of crossed wires, due to the wind or contact with trees and other objects.

The new building, which is to serve as the home of

The new switchboard is of the common battery type and full multiple throughout. The miles of cable will all be terminated in the main terminal room of the exchange, which is supplied with the most modern and efficient lightning protection, and is so arranged that any line in the entire system can be tested by the wire chief in a few seconds.

The plant will be ready for use about the close of September, but the work of cutting the wires into the new cables is already under way. All subscribers will be thus connected up with the new work and the cables will

be trunked into the old office, so that there may be no interruption of service until the new instruments are received and connected up, thus putting the plant on a wholly independent basis. The new instruments will be of the most improved common battery type.

Apart from the work being done in the city proper, the company is sparing no effort to bring its toll lines up to the same standard of efficiency. To this end an entire new copper metallic circuit is being built to Chrisman and from that point to towns west. A new pole line is being built to Marshall, carrying two new copper circuits, connected with the Kinloch long distance lead at that point with five circuits between Marshall and Columbus, Ohio, via Terre Haute and Indianapolis; also with five copper circuits between Marshall and Kansas City, via St. Louis and all intervening points. Through these and other connections, it will be possible to give

subscribers the same long distance toll service, with a very few exceptions, to which they have access at present. The company now has 1,175 phones in the city proper and 545 in the rural districts, making a total of 1,720 in the system.

It has grown rapidly from a small beginning into a great and progressive enterprise, which has been an inestimable source of public convenience and under the management of Mr. Albert Schuler is apparently just entering upon the real fullness of its career of usefulness.

The company has a large number of men taking out the old Bell transmitters and receivers and putting in new ones of the Independent make.

The new building and switchboard are costing about \$32,000 and the company is spending about \$100,000 for the betterment of outside lines, cables and instruments in the city.

## The Situation in South Dakota

In the August issue of SOUND WAVES was published an article from the pen of Mr. J. L. W. Zeitlow, president of the Dakota Central Telephone Company, on the situation in South Dakota. Mr. Zeitlow took the stand that the Dakota Central represented the Independent interests of the state, which opinion is not shared by other telephone men who have made heavy investments in South Dakota telephone lines. The views of those dissenting from the president of the Dakota Central are embodied in the following communication which, it is believed, will attract interest in every state of the union:

EDITOR SOUND WAVES: In reply to your request for a few remarks on the Independent telephone situation in South Dakota, will say, briefly, that the Independent companies in South Dakota are generally *very* prosperous. They are not as numerous as in many other states of the same area, due to the fact that much of our broad prairies is undeveloped.

Our state is new. We have no strictly Independent association in South Dakota. There is an organization known as the South Dakota Telephone Association, composed chiefly of Bell connecting companies, and practically dominated by the Northwestern Bell and Dakota Central Bell companies. But the time is ripe for an independent organization. It will evidently come in a few more months. All over the state Independent companies are springing up. The records of the secretary of state show over 1,000 companies organized in this state during the past year.

The principal Independent companies at the present time are the Citizens' Telephone Company of Sioux Falls, with over 1,600 phones. This company also owns a few hundred miles of toll lines, connected by copper with the Twin City Telephone Company of Minneapolis. The Independent Telephone Company of Yankton, having 500 phones in Yankton, as against 150 Bell phones, and also operating 250 miles of toll lines, connecting with the New Automatic Company in Sioux City by copper lines; the Interior Telephone Company of Chamberlain with five exchanges and 150 miles of toll lines, reaching to Pierre and now rapidly pushing to the Black Hills via the new route of the Chicago, Milwaukee & St. Paul Railway; the Grant County Telephone Company, with exchanges at Milbank and elsewhere and toll

lines connecting with the Twin City Company at the state line; the Missouri River Telephone Company of Geddes with six exchanges and 500 miles of toll lines, operating in ten counties along the Missouri river valley.

In addition to these there are several other smaller companies in different counties scattered over the state, and as far as I am able to learn only two of these companies have any outstanding bonds. Hence, I say, they are prosperous companies. The rates charged in South Dakota are usually high enough to make the business profitable. One dollar and a half per month for rural party line phones is the customary price in most portions of the state and from \$1.50 per month up in towns.

The greatest enemy these companies have is the Dakota Central of Aberdeen, which attempts to pose at all times as an Independent company, but is connecting everywhere with the Bell and fighting Independents all over the state where they cannot force a connection contract to suit the Northwestern of Minneapolis and themselves. More than one Independent man has been coerced into tying himself up into long time contracts with them under the threat that they would cut off connections and spend \$50,000 to "bust" him, or like talk.

Their bluff has been called by a few Independent men who had the backbone to stick for their rights, and I know of not one single instance where they have lost out against the Dakota Central or Northwestern Bell.

The next few years will witness a nice contest in South Dakota between the Independents on the one side and the Northwestern and Dakota Central on the other.

In the humble judgment of the writer the Independents will win, principally because the wholesale jobbing and packing centers with which the people of South Dakota do business are already equipped with prosperous Independent telephone exchanges, owned by the citizens of Sioux City, Sioux Falls, Minneapolis and St. Paul. All these have strong and prosperous Independent exchanges giving as good service as can be found in the world; hence the Independents have the advantage on the start.

There is a movement on foot to consolidate several of the larger Independent companies in the state under one head, and several of the most prominent men of the state are interested in the move. There is little doubt



but that it will be consummated before long. And then a more persistent campaign than ever before will be carried on.

The success or failure of the Dakota Central Bell will depend on their ability to hold local exchange owners with them by getting them into long time contracts. Many of the wiser ones have refused to sign contracts, keeping themselves free from entanglements which they might be sick of later on.

Two new railways crossing the state to the Black Hills will open up closer business relations with that portion of the state and increase the telephone business. The farmers everywhere are clamoring for connections.

The towns insist on good exchanges from the start. The future possibilities of the business are immense. We need a few more live independent telephone men in South Dakota. We all have so much work to do that we cannot find time to attend to one-half what we should. In conclusion I will say, South Dakota is all right in the Independent telephone business and every other way. All we need here is more people to settle our vast prairies and fertile valleys and transform them into fields of golden grain and then we will put a telephone in every house.

Yours very truly,

E. C. WARD,  
General Mgr. Mo. River Tel. Co.

## Fourth Kentucky District Convention

The Fourth Kentucky District Independent Telephone convention was held at Henderson recently. Practically every county in the district was represented as well as a number of manufacturing firms. Among the honored guests were M. B. Overly, president of the state association, who made an interesting little speech, and R. E. Cooper, president of the Hopkinsville Home Telephone Company, who discussed the development of his property in a thorough manner and impressed upon the audience the bright future of the Independent movement in Kentucky.

Mr. Frank G. Hoge, of Hopkinsville, was elected president of the association, and Mr. W. G. Turpin, of Henderson, secretary and treasurer. Twenty local managers were designated to handle the detail work in the various counties comprising the district.

Mr. Hoge's election is giving general satisfaction, as he is known and recognized all over the state as an ardent and consistent advocate of Independent effort. He accepted the presidency in the following pointed speech, which was received with great applause:

### MR. HOGE'S SPEECH OF ACCEPTANCE.

"I certainly feel highly honored to have an opportunity of representing such a noble body of gentlemen as are interested in the Independent telephone movement, commonly known as Western Kentucky, embodying thirty-five counties. My one desire, gentlemen, is to place each and every telephone user in a position to enjoy the many blessings which can only be derived from Independent telephone service, and place all of our local companies in a position to receive the support of our great organization, known in the south as the Central Home Telephone Company.

"Gentlemen, there is only one way to make our district what it should be and accomplish what our association has been organized for, and that is for each one of us as individuals to do everything in our power each day, and never allow an opportunity whereby we may perfect our organization to pass by. We have several telephone companies in our district representing business corporations and companies, as well as many rural homes, that have spent many hundreds of dollars, as well as their valuable time, to build and own telephone systems, whereby they would not be compelled to endure the high rental and poor service, together with many other unpleasant things, always accompanied by a monopoly.

"Therefore we should be bound together with untir-

ing energy, and do everything in our power, striving for the same purpose, namely, good and efficient telephone service at reasonable rates. Such being the case, it would seem out of the question and out of reason to, in any way, allow a foreign monopoly, commonly known as the Bell Telephone Company, or any of its sub-licensed companies, known in our territory as the Cumberland Company, to connect with our lines in any way, as by doing so we would no longer be known in the telephone field as an independent company, fighting for what the word "Independent" means. The condition the Independent lines are in at the present time certainly places each and every local company in this territory, commonly known as Western Kentucky, in a position to receive connection with over three million independent telephones, in the very near future; and inasmuch as we have all denied ourselves many, many times in the past, in order that the Cumberland Company should not entirely control and dictate to us, we should certainly not allow them to pull the wool over our eyes at the present time by accepting any sugar-coated contract they might offer us, knowing the Independent copper lines are being built all over this territory and making arrangements to handle all smaller Independent companies. Such being the case, we are now in a position, as an Independent organization, to place all Independent telephone subscribers in a position to receive a better telephone service and more connections than it is possible to receive from any other company.

"Such being the case, all independent companies will be placed on a dividend basis, and the people will not only receive good and efficient telephone service, but handsome dividends as well. Our district covers thirty-five of the most productive counties in the south, not only controlling the dark tobacco district, and the great wheat belt, but many large mining companies as well. Why should we not have our district numbered among the first in the International Independent Telephone Association, and at the same time earn good dividends for each and everyone of our stockholders?

"Time has proven that there is no safer investment on the market today than Independent telephone securities, and there is no reason why we should not, each and every one, together with our associates, take advantage of the great opportunity we have before us.

"In conclusion I wish to thank you, one and all, in advance, for giving me your hearty support, and assure you that I am at all times at your service."

# Private Branch Exchange Switchboards

By H. P. CLAUSEN

A private branch exchange equipment, as its name implies, is an equipment for permitting the interconnecting of the telephone lines, and it is distinguished from the main exchange switchboard by the expression, "branch," which suggests a comparatively small installation. And the expression "private" provides a designation distinguishing the expression "exchange" from the one operated by the telephone company as being controlled and operated by a subscriber to which the telephone company is giving service. Therefore, we have the expression "Private Branch Exchange Switchboard or Equipment."

By far the greater number of private branch exchanges give service to less than 50 subscribers, thus providing a means under control of the subscriber for rendering telephone service between the heads of the different departments.

Now, in order that the private branch exchange subscribers may be permitted to have their telephone lines connected with any of the lines terminating in the main exchange branch, branch exchange trunks are provided.



These terminate in the private branch board and the private branch operator takes care of their incoming or outgoing calls over these branch exchange trunks.

A private branch exchange switchboard generally consists of a desk type equipment. This for the purpose of permitting the operator to take care of ordinary office work in addition to operating the switchboard.

In a general way, the operation of the board will be as follows:

When the subscriber removes his receiver from the hook switch it results in lighting the lamp associated with the line jack in the switchboard, or in drawing up the armature of the target signal. The operator, upon observing this signal, then places an answering plug into the spring jack corresponding to the line signal. After

drawing over the listening key and speaking to the subscriber, it is found that a connection is wanted with another subscriber whose line circuit terminates in the same switchboard. The operator picks up the calling plug, places it into the called for subscriber's line jack and projects the usual signaling current over the line. Upon allowing the ringing key to restore to its normal position, a supervisory lamp associated with the calling plug lights and remains lighted until the subscriber responds. This supervisory may be of the lamp type or target type. It may be associated with the cord circuit, one for each cord of a given pair, or it may be associated with the line signal in such a way that when the operator places a calling plug into the called for subscriber's line jack it lights the called for subscriber's line lamp or operates his target signal. This signal remaining exposed until the subscriber responds. Whichever method is adopted, when the subscribers have completed their conversation, the disconnect signal will indicate that the connection may be taken down.

If, instead of requesting that his line be connected with a subscriber's line terminating in his own exchange the calling subscriber had requested connection with the main exchange, the operator would have drawn the listening key of the trunking circuit over into its listening position, and in doing so, caused the line lamp to light before an operator in the main exchange. That operator then inserts an answering plug into a jack associated with the lighted line lamp and by inquiry receives instruction from the private branch operator as to the number of the line with which a connection is desired. The main exchange operator then proceeds to ring the called for subscriber in the usual manner. Upon the called for party responding, the supervisor in the main exchange operator's cord circuit is extinguished, and the called subscriber may speak to the private branch operator. The branch operator upon receiving a response from the called party, picks up a trunk plug associated with the listening key first selected and places this trunking plug into a spring jack connecting to the calling subscriber's line. If, in the meantime, the calling subscriber has replaced his receiver to the hook switch, the private branch operator draws over the ringing key associated with the trunking circuit and projects a signaling current over the subscriber's line. But while this current is being projected, the supervisory lamps in the main exchange operator's cord circuit remain extinguished owing to the peculiar construction and disposition of the relays in the trunk circuit. However, the moment that the called subscriber removes his receiver from the hook switch, i. e.: while he is connected to the trunk, it operates a relay in the trunking circuit in such a manner that should the calling subscriber then replace his receiver to the hook switch it will record a clearing signal associated with the trunk circuit at the private branch board, and at the same time, light the supervisory lamp in the main exchange operator's answering cord. If the called subscriber does the same thing, it is obvious that the main exchange operator then receives a complete disconnection and takes the connection down as she would have done had two subscribers' lines terminating direct in the main exchange been connected together.

Thus, it will be observed that in the operation of a

trunk circuit between a main exchange and a private branch exchange, a call which originates in the branch exchange after having once been extended through to the main exchange operator, remains a recorded call, either until the branch subscriber replaces his receiver to the hook switch after having been connected with the trunk circuit, or until the branch exchange operator elects to release the call, which she may do with a special key associated with the ringing and listening key belonging to a given trunk circuit.

It will be observed that the moment a trunk circuit has been extended through to a branch subscriber by the branch operator that the control of this connection from a signaling standpoint has been transferred to the branch subscriber. He may move his hook switch up and down and in response to this movement, the supervisory lamp at the main exchange will light and extinguish. The disconnect signal at the private branch exchange board upon this



trunk circuit, will also operate in response to the subscriber replacing the receiver to the hook switch, but it should not operate upon removing the receiver from the hook switch.

Now, say that a connection in the private branch exchange is called for by a subscriber whose line terminates directly in the main exchange, the main exchange operator upon receiving a request for connection to the private branch subscriber, always receives a request in the form of a call for a certain number. Placing the calling plug into a trunk jack terminating at the private branch exchange, the projection of a signaling current over this trunk circuit results in lighting a lamp or throwing a drop belonging to a trunk and terminating at the branch exchange. The branch operator picks up this connection by drawing over the listening key, and after having once drawn over the listening key in response to such a call, the supervisory lamp belonging to the calling cord of the main exchange operator remains extinguished until, as was explained before, either the subscribers have completed their conversation or the branch operator releases the connection.

Let it be assumed, however, that the branch operator first speaks to the calling subscriber and learns that the calling subscriber desires to speak to Mr. A. The operator picks up the trunk plug, inserts it into the line jack

connecting to a telephone within reach of Mr. A., and projects a signaling current. The fact that the supervisory lamp belonging to the trunk circuit is lighted, indicates to the branch operator that no response has yet been made to the call. Upon Mr. A. responding, the lamp is extinguished, and this has taken place without any change being effected in the condition of the supervisory circuits in the main exchange.

From the previous explanation, it will now be understood that when Mr. A. replaces his receiver to the hook switch, it operates a disconnect signal at the private branch exchange board, extinguishes the supervisory lamp on the calling cord at the main office and if Mr. A.'s correspondent has also replaced his receiver to the hook switch, both the supervisory lamps in the main exchange cord circuit are lighted and therefore the connection may be taken down. The private branch switchboards, as was briefly touched on above, may be equipped with different kinds of line signals, cord signals and trunk circuits. One of the chief considerations being the establishing of an exchange which may be operated on the most economical basis. As a rule, the supplying of battery for the branch exchange telephone is a troublesome problem. Storage batteries may be installed, but if they are installed some means must be provided for charging them. With a direct current lighting system in the building this problem is much simplified, for it is only necessary to connect the lighting circuits to the storage batteries through suitable impedance and resistance coils. Impedance coils, because lighting currents are commercially supplied, are not commutated smoothly enough to permit of their being conducted through a storage battery without producing a disagreeable noise while subscribers are talking, and drawing current from the storage battery at the same time.

Resistance coils or lamps are inserted for the purpose of limiting the amount of current passed into the storage batteries from the lighting circuit. In any event, even with the charging of the storage batteries properly taken care of, the less current there is used at the branch exchange, the more economical the operation.

This matter of current requirement may generally receive further consideration in the direction of operating line signals, supervisory and the operator's telephone as well as the trunk service. The line signals may be of the target type wound to comparatively high resistance and call for a small amount of current. Likewise, the supervisory may be of the target type. The voltage of the exchange may be reduced to very low limit, 14 volts being still high enough to give good service on telephones designed for operating upon 40 volt circuits. The operator's telephone may be so arranged that when listening in on a circuit, it is cut into service and only then.

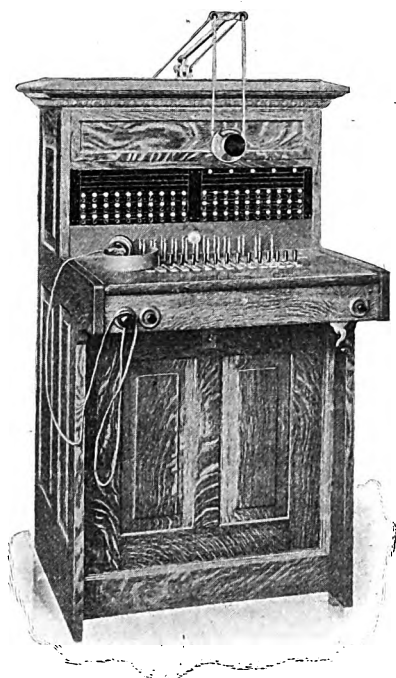
Now, regarding the trunk circuits, these should be designed so that when connection is established between the main exchange and the branch subscribers' telephones, current for this service is obtained from the central office, not only for the operation of the branch subscriber's telephone, but also for the operation of the branch operator's telephone.

While these savings of current may apparently be insignificant, every opportunity for using the main exchange battery should be taken advantage of. There are systems which have been designed and are rendering a satisfactory service in which the current required at the branch exchange is obtained from the main exchange over the trunk circuits. That is, while in their unused condition the trunk circuits supply current to the branch exchange bat-

tery from the main exchange storage battery. And, again, systems have been placed into operation in which the branch exchange does not contain any storage battery, current being supplied direct from the central office through suitable arrangement of impedance coils and condensers. This system, however, does not find much favor.

Many exchanges are being operated from primary batteries, but wherever current is obtainable for charging storage batteries, the primary batteries should not be given any serious consideration.

In conclusion, therefore, it will be observed that in designing a private branch switchboard, the aim is to re-



duce to a minimum the amount of apparatus contained in the equipment, providing a system of current supply which is economical; and, further, to arrange the equipment so that the greatest amount of labor required to be performed in connecting a branch subscriber to a main exchange subscriber is done by the branch operator and not by the main exchange operator. And the last but not the least important feature of a private branch exchange design is, that the service from branch telephones to the main exchange should be as nearly as possible of equal efficiency as though the branch subscribers' telephones were connected direct to the main exchange over an individual pair of wires.

#### Ten Billion Hellos Per Year.

The census office has issued a special telephone and telegraph report for 1902. In that year, it is said, the telephone systems operated more than three-fourths of the wire mileage for both telephone and telegraph lines, employed seven-tenths of the wage earners, paid more than two-thirds of the wages, received more than two-thirds of the total revenues, and met more than two-thirds of the total expenses.

The report remarks that the telephone has had an appreciable effect in restricting telegraph business. Rates for medium distances, it says, differ little, but for long distances they are greatly in favor of the telegraphs. As against this, the report remarks the telegraph is at a dis-

advantage when account is taken of the number of words exchanged, as well as the time required for getting into communication.

For commercial systems the telephone mileage in 1902 was 4,779,571 and the number of telephones 2,225,891; for mutual systems the mileage was 70,915 and the number of telephones 89,316; for independent lines the mileage was 49,965 and the number of telephones 55,747.

The number of salaried employees engaged in the telephone service was 14,124 and the average number of wage earners 64,628. The amount paid in salaries was \$9,885,886, and in wages \$26,369,735. The number of messages or talks reported during the year was 5,070,554,553, of which all but 120,704,844 were local calls, the remaining being long distance or tolls.

Ohio led in the number of messages, with 558,707,801, and Illinois was next, with 541,160,932. In long distance and toll traffic Pennsylvania was first with 20,409,621 messages and New York was second with 20,367,024. On the average there was one telephone to every thirty-four persons and each person talked sixty-five times a year.

Of the 1,157 incorporated urban centers reported in 1900 1,002 were provided in 1902 with telephone systems of some description. San Francisco, with one telephone to nine persons, was the best telephoned city in the United States in 1902, while Cleveland ranked second with one telephone for every sixteen persons, and Boston was third with one telephone for every nineteen inhabitants.

The average revenue per telephone amounted to \$37.50 and the average per message to 1.7 cents, while the average operating expense was \$24.56 per telephone, and 1.1 cents per message. The commercial telegraph systems of the country owned and operated 1,318,350 miles of wire in 1902. In addition, there were 16,677 nautical miles of submarine cable. The twenty-five systems had an investment or capitalization of stocks and bonds of \$162,946,525, a total revenue of \$40,930,038, and total assets of \$195,503,775. A sum amounting to \$15,039,673 was paid in salaries and wages to 829 salaried employees and 26,798 wage earners.

Incidentally the report shows that on January 1, 1901, the number of telephones in the United States was 3,400,000 and the number in Europe 485,784.

#### Indian Territory Meeting.

The managers of telephone properties operating principally in the Chickasaw Nation of Indian Territory held a meeting recently at Wynnewood, I. T., to discuss plans for the betterment of their service. Those present were W. H. Berry, of Ardmore, general manager of the Chickasaw Telephone Company; L. T. Hines, of Purcell, manager of the Purcell and Lexington Telephone Company; W. N. Haynes, of Norman, manager of the Norman and Sulphur Springs exchanges; L. H. Spencer, of Paul's Valley, and E. L. Spencer, of Wynnewood, of the Spencer Telephone Company. These gentlemen represented about 600 miles of toll line and 2,500 local telephones, as well as some farmers' lines. The principal purposes of the meeting was the adoption of uniform toll rates, methods of division of tolls and the planning of a toll line map showing Independent lines through that part of the country. The companies mentioned are without serious competition within their own circuit, but are surrounded by Bell companies. They are loyal and true Independents and working in harmony, with the aim constantly before them of giving the best possible service and remembering the "shield."



# Simultaneous Telegraphy and Telephony

## PART II

The great difficulty in making two telegraph circuits out of one metallic telephone circuit is that there is apt to be unbalancing and then there may be trouble in signalling the telephones without disturbing the telegraph relays. The above difficulties give rise to considerable amount of apparatus which is very expensive and which is apt to give a great deal of trouble unless very intelligent help is employed to keep it in good order.

In figure 7 is shown a method of arranging two telegraph lines so that they may be used as a telephone metallic circuit. A and B are the two telegraph instruments on one of the lines while C and D are the two instruments on the other line. These two lines taken to-

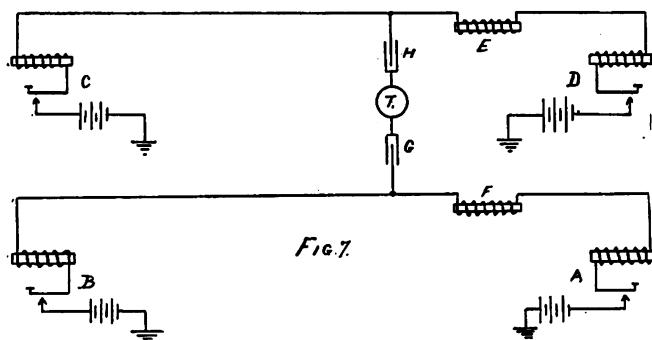


Fig. 7.

gether form one metallic circuit for telephone purposes. T represents the telephone which is bridged across the two lines, having a condenser interposed between each terminal and the telegraph line. E and F are two impedance coils in the telegraph lines. These coils prevent the sound of the working of the telegraph line from interfering with the telephone circuits. Suppose that these coils were not put in the circuit. Then when a telegraph key was pressed the condensers in the telephone circuit would be charged as soon as the current commenced to flow. This would cause a click to be heard in the telephone receiver. When the current was broken at the key the condensers would again discharge and there would be another click heard. Of course there is a charge and discharge when the impedance coils are inserted but the change in the current flow is so slow that there is little or no sound heard in the receiver of the telephone.

When the current is turned on the reaction of the coil prevents its rising rapidly and then when the current is

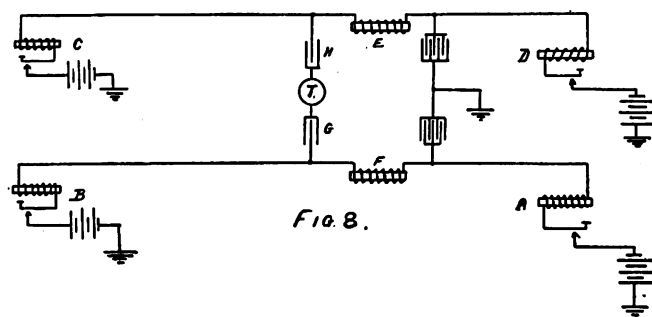


Fig. 8.

broken the coil tends to prolong the flow, preventing its dying away rapidly.

With the above system there are some faults that have to be remedied. If the coils E and F are made

large enough to prevent interference to the telephone circuit, the telegraph signals may be so slow that the earning capacity of the line may be curtailed. To prevent the interference with the telegraph lines the method shown in figure 8 may be used to a great advantage. This circuit is like that of figure 7 except that there are two sets of condensers introduced. These condensers are placed between the telegraph instruments and the telephone. A ground is then attached between the two condensers. Now when the circuit is closed at the key, the condenser connected to that line will be charged, rapidly at first and then slowly. The current in the coil will commence to rise very slowly at the beginning because the condensers are being charged and they take a large amount. Then when the current is broken the condensers discharge into the line and assist to prevent the too rapid reduction in the flow. The capacity of the condensers depend largely upon the dimensions of the line. It is the usual custom to use from three to five 2M. F. condensers in each group.

There is still danger of a click in the receiver caused by the discharge of the condensers H and G. In order to overcome this trouble there are additional impedance coils added between the condensers as shown in figure 9. These impedance coils cause the condensers H and G to discharge very slowly and entirely do away with any disturbance to the telephone circuit. In figure 9 the impedance coils are represented by the letters K and L and the telephone by T. This circuit shows the complete circuit with every precaution taken to prevent dis-

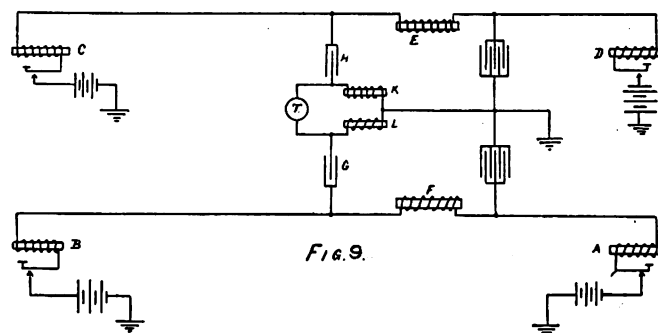


Fig. 9.

turbance to both the telephone service and that of the telegraph.

To any company doing a telephone toll business the telegraph branch of the service is very attractive for the additional service will in many cases double the earnings. One company has reported that the telegraph business pays for all the operating expenses including fixed charges and depreciation. Thus the telephone business is all net profit. It is not probable that all lines can pay in this manner but there is not any doubt but that any company can easily make considerable extra profit if it is so situated that it can reach the people who can use such service.

Competition is very strong, the opponents have the benefit of such service and can help to pay expenses by means of the telegraph. They therefore have a great advantage and may cut prices to the point where one cannot compete if they so desire. It pays to take advantage of every possible chance to increase the earnings.

# Talks and Queries

There are still a number of our readers who send in queries without enclosing stamps and requesting that we answer by special letter. We must insist that you send postage if you expect personal replies. Also, there are some of our readers who still expect voluminous replies personally. We would request all such to bear in mind that we would like to defer such until our succeeding issue, and reply in our columns. We are as liberal in this regard as we can possibly be. You can readily see that were we to answer all questions requesting personal replies fully and completely, our correspondence in this department would be burdensome indeed. Kindly bear in mind our conditions, realizing that there are from seven to eight thousand other parties who are just as interested in receiving personal replies as you are.

TECHNICAL EDITOR.

EDITOR SOUND WAVES:—1st:—How may I obtain the drop in voltage in a certain line without knowing the amount of current flowing? The initial voltage is known.

2nd:—Please explain the action on the alternating current circuit of condensers of different capacities? What size of condenser is used on party lines to prevent parties from short circuiting the ringers by having the receivers off the hooks?

3rd:—I have noticed that in some common battery operators' sets there is an impedance coil in series with that receiver, while in others there is none. What is the object of having the coil?

4th:—I have a small annunciator drop that operates strongly on dry cell, but 24 volts will not budge it. Why is it? Why won't a small buzzer operate on the same voltage?

5th:—We have a copper grounded circuit about fourteen miles long. If an iron wire be now run and the two used as a metallic circuit, and transposed at regular intervals, would the circuit be as well balanced as if both wires were of the same metal?

1st:—If you have the circuit attached directly to the source of the electro motive force with no intervention resistance, the voltage would be that of the source of the energy. If you wish to find the drop in voltage between any two portions of the wire, you must know the total resistance of the whole circuit and the resistance of the portion over which the drop is desired. Suppose that the whole circuit has a resistance of 150 ohms and the portion around which the drop is required measures 30 ohms. Let the total voltage be 100. Then  $30:150 = x:100$ . X represents the drop in voltage and in this case is 20 volts. In other words the resistance of the part around which the resistance is desired bears the same relation to the total resistance as the voltage desired bears to the total voltage.

2nd:—The fore part of your question is a little obscure as it is not known just what phase of the relation of alternating current to the condenser you wish discussed. The general subject may be made to fill a good sized volume with an endless amount of abstruse mathematics. If you wish to know how the condenser may be affected by alternating current it may be explained as follows: When any current passes onto a conductor of any kind it is always charged with a certain amount of static electricity as long as there is no circuit and as long as there is an electro motive force applied. The amount of electric charge depends upon the surface, the material of the insulation surrounding it and the distance apart of the two conductors to which the electro motive force is applied.

A condenser, as is well known, consists of two flat

conductors, usually of tin foil, separated from each other by some insulation. The two conductors are separated from each other by a very small space and the resistance of the insulating medium is very high. When the condenser is in the circuit and an impulse of electricity is passed into it, the condenser is charged. If the current is reversed, the charge in the condenser passes out and then the condenser is charged in the opposite direction. As often as the current is reversed the condenser will be charged and discharged as above explained. It will thus be seen that the current does not really go through the condenser but merely to it and then back again. The slower the alterations, the less will be the amount of current that will be dissipated by the condenser and that is why the receiver that has the condenser in circuit will not short circuit the ringing current but will permit the passage of the talking current with but little diminution. The ringing current has about fifteen periods per second while the talking current will have at least 250 alternations in the same time. The larger the capacity of the condenser, the more the ringing current will be shortened. So it is necessary that the capacity shall be fairly low. The size usually used for inserting in the receiver circuit is  $\frac{1}{2}$  M. F. For use in the bell circuit in central energy telephones a condenser of 2 M. F. is used.

3rd:—The coil may be used to prevent the shortening of conversation when the operator listens into the connection. It may be a balancing coil so as to prevent the busy test from unbalancing the circuit. It may be used instead of an induction coil as is the case in some circuits. We would have to have the complete circuit in order to say definitely.

4th:—If you connect your annunciator into the 24 volt circuit and then measure the voltage across the terminals you will find that you do not have as much voltage as you think. You probably have a high resistance in circuit with the battery and the drop across the annunciator which is of very low resistance is but small. See the answer to your first question. Apply the drop directly to the terminals of your battery and you will see that it will operate all right if the battery is good. The buzzer will probably work if you take the resistance out from the circuit. The buzzer will probably be operated so strongly that the armature will stick and the contacts burn if you apply it directly to the terminals of the battery. If you want the buzzer to work through a high resistance and from a 24 volt battery wind it to 500 ohms.

5th:—If you transpose correctly with respect to adjacent circuits, and if you connect the copper to the iron at each transposition and if the iron wire is the same size as the copper the lead will be balanced all right. Be sure that you have all the joints perfectly soldered or you will live to regret that you ever went into the telephone business. When copper and iron are connected together and not soldered, there will soon be corrosion and a high resistance joint is the consequence.

EDITOR SOUND WAVES: Please explain to me the use of the impedance coil? Can you give me the names of any good companies that make coils?

Impedance coils such as are used in telephone work are nothing more or less than coils of insulated copper

magnet wire wound about iron cores. Such coils are used to prevent the passage of voice currents but will allow the passage of current from a battery or an alternating current of low frequency such as the ringing current. These coils are wound to various resistances depending upon the requirements of the service.

These coils may be furnished by any of the telephone manufacturers or others dealing in similar supplies who advertise in our columns.

**EDITOR SOUND WAVES:**—I would like to know some good way to lay 100 feet of cable (lead covered) across the street to my switchboard, and protect it from water and freezing, without conduit or a very great expense. How would it be to lay it in a box of coal tar?

You very likely can get wooden pump tubing in your town from some pump dealer. Dig a trench across the street and in this lay the tubing so that all moisture that enters will drain out at one or the other or both ends. The sections should be firmly driven together after applying tar to the extremities. Then apply hot tar to the outside of all the tubing for protection from rot. It would be a very good idea to tar each section inside and out. After the tube is laid in the ground, pull in the cable. This should be cheap. If you cannot get the tubing build a box across the road; use planking at least two inches thick. Each plank should be thoroughly tarred so that the box will be water tight. Do not lay the cable in tar, that is, do not use the tar except as a wood preservative and for keeping out moisture. If the cable is imbedded in tar you cannot remove it very easily in case it becomes necessary.

**EDITOR SOUND WAVES:** Will you please advise or publish in your next issue of SOUND WAVES if there is any law or decision of higher courts as to telephone companies taking care of their wire on public roads for house movers. Please publish the law or decisions if any.

When the writer was in charge of a telephone company he generally tried the effect of diplomacy with the house mover with a bluff now and then and if neither worked he cut the wires. It is our opinion that it is the duty of the company to allow movers to pass if the city authorities gave the mover permission. We would like to hear from others regarding this subject. The law may differ in various states. This state was Indiana.

**EDITOR SOUND WAVES:** I have a bridging line seven miles long with thirteen telephones installed, each having 1,600 ohm ringers. I am having some trouble with this line. On one portion of the line the bells ring all right while on the other portion they hardly ring at all.

The bells are all adjusted accurately and the affected phones work all right when disconnected from the line but as soon as connected to the line the generator can hardly be turned and the bells will tinkle only the least bit and it seems almost like a dead ground. I have examined the entire line and found no ground either on line or phone.

There are some trees touching the line, but this would cut the ringing down in wet weather only. The trouble is the same in dry as in wet weather, and half the phones always work well while the rest do not. The talking is quite good on all phones. Please give some information regarding the above and oblige.

We feel sure that you have not looked over your line properly or you would find some place where there is a partial ground. The portion of the lines carrying the telephones which are working all right are, no doubt, at the end farthest from the trouble. The resistance in the line between the partial ground and these instruments is sufficient to prevent interference to their ringing.

You are mistaken that trees cannot cause the trouble

in dry weather. This frequently happens but not unless there are quite a number in contact with the wire.

It may be that this line connects to an eighty ohm drop at the switchboard. An eighty ohm drop would have the same effect on the line as adding more than a dozen 1600 bells. With this number of bells added, you can see that your line would be overloaded. You should have a high wound drop.

If your drop is all right and you cannot find the trouble, disconnect everything from the line and then start in to test. Commence in the middle and cut the line in two. Then with a series bell test between line and ground if a grounded line and across the circuit if metallic. If you get a ring on the bell you will know that there is a partial or full short circuit. Try both halves of the line for there may be two cases of trouble. On the portion of the line which is in trouble you should proceed as before and keep on in that manner till you have run the case down.

You should be very sure that none of the arrestors on the circuit are grounded. If you have a metallic line it may be that one of the telephones is grounded on one side of the arrestor and another on the other side. If these are quite a distance apart or not strongly grounded there will not be much trouble in talking but there will be trouble in ringing. The telephones will work all right when disconnected in this case.

#### Compromise Agreement Accepted.

The Richmond Home Telephone Company, Richmond, Ind., of which A. C. Lindemuth is president and W. M. Bailey secretary and manager, has long been a recognized champion of Independent telephony. The Independent lines of Eaton, Camden and other towns in Western Ohio brought suit against the Richmond company to enjoin it from cutting off its service because the Ohio companies had entered into business relations with the Bell company. The suit has been dismissed by an agreement, according to whose terms the long-distance systems of the home companies must be given the preference and the Bell can be used only when patrons cannot get Independent connection. The Richmond Home Telephone Company now has 2,324 phones in use and is making plans for an entirely new plant. The city council recently passed an ordinance granting the company the right to increase its rates from \$30 to \$36 for business and from \$15 to \$18 for residence service. The company was organized in 1899 and has a capital of \$175,000.

#### Important Telephone Deal.

Some of the members of the directorate of the Consolidated Telephone Company, Buffalo, N. Y., have interested themselves with the Great Eastern Telephone Company in assisting to obtain a favorable adjudication of the franchise rights of the New York Electric Lines Company, a corporation which has a franchise in the city of New York under which it has the right to construct conduits and lay cables for telephone, telegraph and electric light purposes. This franchise has been passed on favorably by the first courts through which litigation has gone, and the parties interested look for favorable decisions in the higher courts. If these decisions are favorable the franchise will be a very valuable right for the Independent telephone business in general because it would give Independent companies direct connection with New York. The new combination becomes the most formidable rival the Bell has ever had in the east.

# Meeting of the Canadian Association

(EDITORIAL CORRESPONDENCE)

That Independent telephony is a living issue in Canada was evidenced Sept. 5, when a goodly number of delegates from all over the Dominion assembled in Toronto's magnificent city hall to participate in the proceedings of the first annual meeting of the Canadian Independent Telephone Association.

The assembly was radically and unequivocally anti-Bell. No discordant voice was heard. Every action was characterized by unanimity of voice and vote. Earnestness was the dominating trait of every delegate, and every visitor was impressed by the sincerity of the speakers and the far-reaching possibilities of the resolutions adopted.

The convention was no place for trimmers and half-hearted operators. It was Independent from beginning to end. The omega of the Canadian declaration of telephone independence rang as clear as the alpha, and both could be heard from Halifax to Victoria.

Among the delegates was a goodly number who expressed themselves forcibly against long-distance contracts with the Bell and just before adjournment a resolution was adopted prohibiting the purchase of new equipment from the Kellogg Switchboard and Supply Company and the Northern Electric Company of Montreal. The following is a partial list of the telephone

Fox, Northport, Ont., promoter; Jas. Haryett, Maynooth, Ont., People's Tel. Co.; Dr. W. Doan, Harrietsville, Ont., Harrietsville Tel. Co.; H. F. Boyse, Ingersoll, Ont., Ingersoll Tel. Co.; Jno. Burgess, Kirby, Ont.; Dr. T. F. Demers, Levis, P. Q.; W. A. Fullers, Markham-Pickering Tel. Co., Green River, Ont.; D. D. Yorke, councillor, North Dorchester, Ont.; St. George Lamoine, Beauce Tel. Co., Beauceville, P. Q.; F. A. Dales, Stovall & Bethesda Tel. Co., Stovall, Ont.; G. W. Jones, Clarke-Hope Phone Line, Port Hope, Ont.; J. A. Sprague, Sprague Tel. Co., Demorestville, Ont.; W. H. B. and E. J. Dickinson, Clarke-Hope Phone Line, Port Hope, Ont.; R. Y. Ellis, Stark T. L. & P. System, Toronto; Geo. B. Wright, York State Tel. Co., Binghamton, N. Y.; Col. A. E. Belcher, mayor of Southampton; F. D. Mackay, Canadian Machine Tel. Co., Toronto; J. C. Keenan, Keystone Engineering Co., Toronto; C. W. Davidson and John Brodie, Mt. Albert Tel. Co., Mt. Albert, Ont.; Dr. Anthony Ochs, Hespeler, Ont.; Thos. Patterson, N. E. Clark Phone Line, Kendall, Ont.; B. G. Hubbell, Pres. Consolidated Tel. Co., Buffalo, N. Y.; J. L. Wilson, Alexandria, Ont.; Jno. W. Hyett, Prince Edward, Ont.; Geo. L. Wilson, Toronto; C. G. Strange, Barrie, Ont.; Alex. Neilson, Brown's Corners, Ont.; A. G. Reesor, Markham Pickering Tel. Co., Locust Hill, Ont.; C. Skinner, People's Tel. Co., Sherbrooke, P. Q.; E. Barrowclough, Clarke-Hope Phone Line, Port Hope, Ont.

The meeting was called to order by President Alpheus Hoover, of Green River, and was given a civic welcome by Ald. Graham and Mayor Coatsworth, both of whom commended the Association for its activity in working for the establishment of Independent lines in Canada.

After acknowledging the welcome the president introduced Hon. Colin Campbell, attorney general of Manitoba, who delivered a magnificent speech which was received with great applause. In the course of his remarks Mr. Campbell said:

"I presume that Manitoba is the only government represented at this convention, but if I mistake not it will not be long before every government will find it in their interests to be identified with this movement. The interests we represent are the interests of the people. We believe that the days of the telephone are just beginning. We believe that it should be taken hold of and given to the people at a reasonable cost.

"It is three years since I took up this question with the premier of the province. We have made some progress, although not all we expected."

Speaking of the west, he said: "We are the greater Canada lying west of Lake Superior, not in what has been but in what has to be. The government has come to certain conclusions and they will be submitted to the people of Manitoba at an early date, and if they are adopted a new telephone era will be established in that province. This is not a political movement in Manitoba. The commission appointed by the Manitoba legislature never had a division and it came to the unanimous conclusion that the long distance lines should be owned by the government and that the municipalities should own and operate the local exchanges, and by so doing remove



ALPHEUS HOOVER.

President Canadian Independent Telephone Association.

men in attendance, with manufacturers and salesmen omitted altogether:

Dr. E. Hart, Canadian Mach. Tel. Co., Bradford, Ont.; Alpheus Hoover, Green River, Ont.; A. F. Wilson, Markham, Ont.; P. W. Ranke, Southcote, Ont.; J. C. McIlwain, Harrietsville, Ont.; A. J. Welch and T. R. Mayberry, Ingersoll Tel. Co., Ingersoll, Ont.; Dr. N. Colville and C. J. Thornton, Orono, Ont., Durham Telephone Union; Martin E. Mith, Burgessville, Ont.; Burgessville Tel. Co.; W. H. Lytle, Toronto, Canadian Machine Tel. Co.; Dr. A. C. Beatty, Garden Hill, Ont.; S. B. Purdy, Keswick, Ont., N. Gwillembury & Sutton West Co-Operative Tel. Co.; A. W. Venning and J. W. Daws, Belmont, Ont., Belmont Tel. Association; C. B. Adams, Harrietsville, Ont., Harrietsville Tel. Co.; P. H.



one of the greatest obstacles to the local telephone business."

The Manitoba government, concluded Mr. Campbell, had agreed to construct the long distance lines, and had asked the municipalities to submit to the people the question as to whether they are willing to operate their local systems, and if there were enough prospective subscribers the government would endorse their bonds. This was submitted as a municipal question, and the government looked forward to the result with confidence.

A resolution was passed relating to franchises to the effect that the granting of exclusive franchises is detrimental to the progress of cheaper and better telephony, and no municipality should have the power to grant exclusive franchises to any company, and the association should petition the legislature to rescind all legislation which makes this possible.

A resolution passed on the railway act referred to amendments to the act made at the last session of the Dominion parliament as most unsatisfactory and inadequate, especially those amendments relating to matters between telephone companies and railways, and stated that the machinery provided by the act for recourse to the Railway Board of Canada is unduly expensive to local companies, particularly farmer lines; that difficulties thrown in the way of independent companies and municipalities by the railways have been in the interests solely of the monopoly; that arrangements should be made with the railway companies so that access to and the placing of independent instruments in railway and other depots might be effected, and also so as to secure the privilege of crossing telephone lines over railways, the use of railway bridges and other communications in order that all telephone companies shall be placed on the same footing; that an effort be made to influence the Railway Board to make such provisions and regulations that applications in regard to telephone matters may be made simple, speedy and inexpensive, and that in the event of fair and reasonable arrangements not being obtainable from the transportation companies, the executive committee take steps to petition the governor-general in council and parliament for redress.

The resolution on long distance connection was to the effect that inter-communication between local systems and long distance business should be secured exclusively over or by means of trunk lines operated by Independent companies or owned by the province.

The report of Secretary Wilson, presented to the convention was as follows:

Statistical report of Independent Telephone companies in Canada:

Number of absolutely independent or non-Bell companies or private systems.....	73
Number of shareholders.....	3248
Number of subscribers, Aug. 15, 1905.....	6427
Number of subscribers, Aug. 15, 1906.....	12,073
Increase in one year.....	5,646
Capital invested .....	\$850,000

The above does not include the Central Telephone Companies of New Brunswick.

The annual report of the Bell Company of Canada shows that on December 31, 1905, it had 78,195 subscribers, and an increase in 1905 of 12,035.

It has been a somewhat difficult matter to obtain full information and figures regarding Independent telephone systems in Canada, covering as it does half a continent, and it at first being very difficult to know with whom to enter into communication. By means of writing to those known to be in sympathy with the movement, and who are refusing to affiliate with the monopolistic company, we have come into touch with about 90 independent telephone companies, privately owned lines and municipal systems. The figures given above are taken from the

reports sent direct to the secretary by the officers of the different companies and municipalities and owners, and are thoroughly reliable.

There are a large number of other Independent systems, especially in the west and Nova Scotia, knowledge of whom was received so late that reports have not yet been returned, and the figures given are considerably below the actual number. If any persons knows of any new company starting or any independent person about to start an Independent telephone system, however small, and will notify the secretary, it will be doing a great service to the association and Independent interests, as well as to those who are about to invest in an Independent telephone system.

The statistics given above do not include any company or person having connection in any form with the Bell Telephone Company of Canada, or its subsidiary companies, with the exception of one private line in Quebec having one telephone, and another line of fifty telephones which connects with both Bell and Independent lines. Reports have been received since the foregoing statistics were compiled, which will more than make up for the number of 'phones included in the statistics which have Bell connection.

To the Bellechase Co., of Quebec, of which Mr. Demers is the manager, belongs the credit of having made the greatest increase during the year. To the Province of Ontario belongs the credit of having made the most rapid advance of any province, the increase in that province for the year being nearly 3,700. The reports have been received from four municipal systems only.

In view of the fact that more than half of the Ontario companies are only a few months old, that there had been no telephones manufactured in Canada, and equipment had to pay a duty of 25 per cent. in addition to other burdens, that there has been little or no inter-communication except with local companies, that Independents have to compete against the most strongly entrenched monopolies in Canada, and that development has been confined largely to the rural parts, the Bell Company with few exceptions (among which are Sherbrooke, Levis, Brantford, Peterboro, Ingersoll and Toronto Junction), having the towns and the cities to itself, is seen the force of the movement for competition in telephony just begun, and for the first time organized.

At the afternoon session the president called upon a number of delegates to express their ideas. Most of them denounced the Bell company roundly and all asked for trunk lines.

Mr. C. Skinner, manager of the People's Telephone Company, Sherbrooke, Que., said: "I've come 420 miles to hear from you, because we are highly interested in legislation at Ottawa which affects railway connections. We want your sympathy and influence in behalf of fair legislation for the Independents. The government, it appears to me, is not in our interests. The minister had a clause in the act which would have suited us all, but it was totally whiped out. If we can have the railway stations in our province we want nothing more. We would not accept connection with the Bell Telephone Company under any circumstances. It would mean that we would be eventually wiped out. I represent a company possibly the oldest in Canada competing with the Bell. After 18 years we are still in existence. If the Bell can't wipe you out they will make your earnings as small as possible. When they give a 25-mile service for 10 cents, we compete with it, but we are not on an equality when they keep us out of the railway stations. We seriously object to this monopoly at the stations. Let us exert our influence throughout the Dominion for some good results at Ottawa. See your local member and all the members you have any influence with and urge upon them the justness of the cause. Get the facilities and the rights which belong to it and appeal to their sense of fairness."

Dr. MacKay, vice-president of the association, said: "Our exchange is operating successfully in Peterboro, and the Bell have had to go into extensive reconstruction. It's been the same in Brantford. We have made

them re-equip their exchanges. But for competition, old conditions would have remained. We have the support or 90 per cent. of the people, particularly in Peterboro and Brantford. Edmonton is installing a municipal plant, where the Bell now only have a toll station. The independent telephone investment has had a year of which we may all be proud."

Mr. Francis Dagger, for some years Dominion telephone expert, and now expert to the Manitoba government, read a most interesting paper on "The Canadian Telephone Situation from an Independent Standpoint," which is reprinted in full in another part of this issue.

Mr. Max R. Eaton, of Niagara Falls, N. Y., secretary of the New Yory Independent Telephone Association, stated that the Independents had won a great victory over the Bell on the American side of the falls, and would try to get another on the Canadian side. He had applied on the Canadian side and had been told the Bell had an exclusive franchise, whether secured by righteous or unrighteous means his attorney would not say, but it was on the books. "We have the gateway for your toll lines to the United States. Meet us half way and if you stand by us and help us we will stand by you," was the test of Mr. Eaton's remarks. He announced his intention of seeing that the Independents get properly into Niagara Falls.

President J. B. Hoge of the International Association said that Canada had now great opportunities for going right into the telephone business. In the United States 11 years ago there were only 300,000 phones, and that was after the Bell Company had had 17 years of complete monopoly. To-day Ohio has close to the 300,000 in Independent phones alone. There are full six million phones now in the United States, and of this number three and a quarter millions are Independents. That shows what competition can do.

"Do no business with the Bell Company. Carry out that policy," urged Mr. Hoge as he asked that the Canadian association become affiliated with the American for mutual benefit.

The convention voted that Mr. Hoge's invitation be accepted and empowered the new executive to arrange the details of the affiliation. It was also decided to adopt a uniform long-distance sign and, on the suggestion of Assistant Secretary Harney of the International Association the delegates expressed themselves in favor of a shield surrounding a maple leaf, with the inscription "Local and Long Distance Independent Telephones."

Dr. Doan, of Harrietsville, Ont., pleased the audience with a clever address on "Our Duty to the Public and Ourselves," which will be published in the next issue of SOUND WAVES.

Just before adjournment the following officers were unanimously elected for the ensuing year:

President—Alph. Hoover, Green River, Ont.

First Vice-President—F. D. Mackay, Toronto.

Secretary-Treasurer—A. F. Wilson, Markham.

Executive Committee—Dr. T. F. Demers, Levis, Que.; Dr. W. Doan, Harrietsville; C. J. Thornton, ex-M. P., Kirby; Dr. Ochs, Hespeler; Richard Vigars, Port Arthur; Dr. E. Hart, Brantford; Levi Moyer, Beamsville; F. Dagger, Toronto, and C. Skinner, Sherbrooke, Que.

The Winona Telephone Company, Winona, Minn., of which Otto Troost, Jr., is manager and secretary, now controls four brand new exchanges—at Rushford, Lanesboro, Lewiston and Rolling Stone.

### Keystone Company Is Prosperous.

The Keystone Telephone Company of Philadelphia earned \$820,842 gross, and \$289,478 net, applicable to bond interest, in the twelve months ended June 30, these results being just about what was expected. The net result was had after deducting \$77,427 for a renewal reserve, this charge being about \$4 per telephone per year. The surplus of \$78,486, after paying interest on the \$4,000,000 outstanding bonds, is considered a substantial margin above fixed charges. The gross earnings were an average of \$68,400 per month, as against \$65,000 in the calendar year 1905, and \$57,000 in the twelve months of 1904, this increase showing the progressive strides being made by the company. The gross earnings per month now average over \$70,000, the June results being \$75,603. The charge for renewals for June are on a basis of about 21,700 telephones, these figures comparing with about 19,000 telephones at the close of 1905. This is a gain of 2,700 telephones in six months. It is expected that nearly 25,000 telephones will be installed at the close of the current year.

### Making Many Improvements.

The Farmers' Mutual Telephone Company of Whitley county, Indiana, is among the most progressive Independent organizations in the Hoosier state. The company was incorporated in 1903, with \$25,000 capital, which has since been increased to \$100,000. The central office is located at Columbia City, with sub-stations at Laud, South Whitley, Larwill and Etna. With the sub-stations the main exchange is connected by metallic circuits. So far about \$45,000 has been invested. The company has about 125 miles of poles and over 500 miles of wire. The principal part of trunk line construction is completed, with 1,000 phones in operation. Recently the board of directors deemed it advisable to secure a loan to cancel all out-standing obligations and complete short connections of which there are approximately 500, besides giving an opportunity for stock previously subscribed to mature. These facts are given to clear up some misstatements concerning the Farmers' financial condition which have been circulated in the territory where it operates.

### National Is Expanding.

At a recent meeting of the board of directors of the National Telephone Company, at Wheeling, W. Va., a semi-annual dividend of three per cent was declared and definite action taken regarding the extension of the company's lines. It was decided to complete the line from Wheeling to Mannington and Fairmont, at a cost of approximately \$40,000. This extension will give the company direct communication with Morgantown, Clarksburg, Grafton and all their connecting points and will leave only twelve miles remaining to complete the line to Parkersburg and Marietta. The company has also entered into a contract with the United States Telephone Company for the construction of a line from Wheeling to Cambridge, Ohio, which will give it connection with Columbus, Indianapolis, Toledo and intermediate points, including connections with the Independent companies of Ohio, Michigan and Kentucky. In addition to this outside work local improvements will not be neglected and 100,000 feet of new cable are to be strung at Wheeling to replace old cable that is worn out.

# Canadian Telephone Situation from an Independent Standpoint

By FRANCIS DAGGER

(Address Delivered Before Canadian Independent Convention at Toronto, Sept. 5, 1906.)

It will be just one year to-morrow since the Canadian Independent Telephone Association was organized in this city for "the purpose of bringing into more general use, improving, and cheapening telephone service in Canada." That organization was no doubt in a large measure due to the universal interest in the telephone conditions throughout the Dominion resulting from the inquiry carried on during the session of 1905 by the Select Committee on Telephone Systems, under the chairmanship of Sir William Mulock, then postmaster-general.

As it was my privilege to be actively associated with that committee, in the capacity of technical adviser, and as the inquiry brought to light much information of interest regarding the Canadian telephone situation I have thought that it would be appropriate on this occasion for me to place before you a few of the more important facts relating thereto, and to endeavor to make certain deductions therefrom, which, I trust, will afford some encouragement to the members of this association in their effort to provide the people with a telephone service which shall be free from the restrictive and other objectionable features so long associated with "Bell" methods, both in this Dominion and in the United States.

I would preface my remarks with an expression of sincere regret that the work of the telephone committee has not been crowned with that measure of success, from the public viewpoint, which it merited and which the citizens of Canada anticipated, owing in the first place to the unavoidable absence of Sir William Mulock in England on official business, during the latter part of the session, and secondly to the unexpected retirement of that able and public spirited statesman from the government. Many statements have been made regarding that gentleman's retirement, and not being a politician I do not intend to offer an opinion thereon, but this I do know that Sir William Mulock left the government with his views on the telephone question unchanged, and thoroughly convinced that the inquiry which he had instituted was justified by the facts revealed to the committee.

It is indisputable that the influence exerted by the "Bell" upon the members of the committee was much more pronounced and effective after the departure of Sir William Mulock for England. This influence was also no doubt largely responsible for the subsequent policy of the government upon this question.

I believe I am expressing the views of a majority of the people of Canada when I say that the telephone question has not been dealt with in a manner calculated to reflect credit upon the government. It is beyond question that when parliament rose in July, 1905, the telephone inquiry was left in an unfinished state. Since that date a large amount of documentary evidence asked for by the committee, mainly upon the question of government ownership of the telephone service in other countries, notably Australia, Austria, Bavaria, Belgium, Cape Colony, Ceylon, Denmark, Germany, Great Britain, Holland, Luxemburg, Natal, New Zealand, Norway, Russia, Switzerland and the Transvaal, was received and printed. This evidence covers upwards of 600 pages and in view of the fact that the question of public ownership of the telephone service was brought very prominently before the committee in the form of resolutions from a large number of municipal and other public bodies extending from the Atlantic to the Pacific, it is certainly a matter for surprise that the government did not appoint a committee last session, with instructions to consider this evidence and prepare a report with recommendations to parliament, on this and other important points raised during the inquiry. It is difficult to understand why so important an inquiry, lasting five months and covering over 2,000 pages of testimony, should have been allowed to close without such a report and recommendations being made. The answer probably is that the testimony recorded justified the adoption of a policy which does not meet with the approval of parliament. This is not surprising to any one who saw the keen anxiety, more keen at times than that of the paid legal counsel, on the part of certain members of the committee on both sides of the house, to defend the Bell Telephone Company, and to choke off testimony in favor of public ownership and Independent telephony. When we remember these influences it is a matter for congratulation that legislation has been passed amending the Railway act in the interest of Independent telephone systems, though it is rather early to predict whether the working of those amendments will produce satis-

factory results. The day will come, however, when public policy will rise superior to the personal opinions of our legislators and the selfish interests of corporations who will not furnish the people with adequate service, and intimidate our lawmakers to place unfair restrictions on legitimate competition.

In the meantime, parliament having declined to afford any material assistance in the development of the telephone service of the country, it rests with the people to co-operate with private enterprise in carrying on this work effectively, and in order to arrive at the best means of doing so it is necessary to review the situation and profit from the lessons of the past.

Starting with the history of the Bell Telephone Company of Canada, as revealed during the inquiry, we find that in 1880 Mr. C. F. Sise, now the president of that company, came from Boston to Canada, representing the United States monopoly, and organized the Canadian Telephone Company, which, while it was in existence, was the sole licensee in Canada of the "Bell" and "Edison" patents. This concern was not an operating company, but leased the right to operate to the Bell Telephone Company of Canada, a corporation organized about the same time, Mr. Sise holding the dual position of vice president and managing director in both companies.

The agreement between these two corporations provided among other conditions that the Bell Telephone Company of Canada "will from time to time hereafter, in case any increase in its capital stock shall be made, issue to the Canadian Telephone Company one-third of such increased stock fully paid and not subject to any assessment or contribution."

This agreement was cancelled two years later, according to the evidence, by a payment of two shares of the Bell Telephone Company of Canada's stock for each share of Canadian Telephone Company's stock. This stock was afterwards transferred to the American Bell Telephone Company and the Canadian Telephone Company went out of existence. Whatever construction can be placed upon these transactions, it is interesting to note that the American Bell Telephone Company and its successor, the American Telephone & Telegraph Company, have at all times since 1882 held over one-third of the capital stock of Bell Telephone Company of Canada. The testimony of the "Bell" witnesses is to the effect the stock held by the American Telephone & Telegraph Company is represented by cash payments at par. Nevertheless one cannot help remarking that holdings of the American company have always been corroborative of the original agreement with the Canadian Telephone Company. Further than this, the action of the Boston monopoly in selling its territorial rights in the Dominion of Canada, together with all future patents acquired by the American Bell interests, for a payment, in stock, of \$354,000, is in marked contrast with the dealings of that corporation with its licensees in the United States.

We are told that the American company does not control the Bell Telephone Company of Canada. True, the American company does not hold a controlling amount of stock in its own name, but it is fair to assume other holdings representing that corporation's interests will exceed balance of 12 per cent. necessary to obtain such control. Moreover, we find the American company's interests on the Canadian directorate of eight members amply represented by the following names:

President: C. F. Sise. (Who promoted the business in the interest of the Boston companies).

F. P. Fish, president of the American Telephone and Telegraph Co.

W. R. Driver, treasurer of the Am. T. & T. Co.

T. Sherwin, auditor of the Am. T. & T. Co.

I bring these facts to your notice in order that you may fully realize, and I would ask our friends from the United States to note this, that the interests of the Bell Telephone Company of Canada are identical with those of the American Telephone & Telegraph Company, and that therefore there must be no dividing line in the cause of Independent telephony in this Dominion and the United States. The opposing forces are the same, the cause is the same, and there is no reason why you should not achieve the same successes as the Independent companies of the United States.

I would like to call your attention for a few moments to some of the inconsistencies presented in the "Bell" statistics furnished during the inquiry, from which you may judge the

true value of the evidence of that company. You will no doubt remember that the committee called for statements showing the cost of plants, the operating and maintenance expenses, and the revenue, of exchanges of different sizes. I have here a return of ten cities and towns for which these particulars were furnished. They are as follows:

#### CAPITAL EXPENDITURE PER TELEPHONE.

Toronto with 12,832 phones, \$123.00; Winnipeg with 4,121 phones, \$128.43; London, Ont., with 1,930 phones, \$102.87; Windsor Ont., with 698 phones, \$158.10; Calgary with 460 phones, \$59.40; St. Jones, Que., with 300 phones, \$94.58; Cornwall, Ont., with 274 phones, \$116.73; Lethbridge with 113 phones, \$75.79; Winona, Ont., with 85 phones, \$62.48.

It would be interesting to learn why the system at Windsor, with 698 telephones, should cost \$35 per phone more than that of Toronto's 12,832 telephones; \$30 more than Winnipeg with 4,121 telephones; or \$55 more than London, Ont., with 1,930 telephones. Or, again, why the plant at Calgary, with 460 telephones could be built for \$59.40 per telephone, when St. Johns, Que., with 300 telephones, cost \$94.58; and that in Cornwall, Ont., with 274 telephones, \$116.72.

#### COST OF MAINTENANCE AND OPERATION PER TELEPHONE, PER ANNUM.

This works out as follows: Toronto with 12,832 phones, \$29.22; Winnipeg with 4,121 phones, \$30.22; London, Ont., with 1,930 phones, \$21.31; Windsor, Ont., with 698 phones, \$37.02; Calgary with 460 phones, \$25.47; St. Johns, Que., with 300 phones, \$33.71; Cornwall with 274 phones, \$20.56; Lethbridge with 113 phones, \$36.83; Winona, Ont., with 85 phones, \$13.69.

It is difficult to understand why in Windsor 698 phones cost \$37 per phone per annum, St. Johns with 300 phones, \$33.71, and Lethbridge with 113 phones, \$36.83; when Toronto's 12,832 phones cost only \$29.22, Winnipeg's 4,121 phones \$30.22, and London's 1,930 phones \$21.31 each per annum. Or, to make closer comparisons, why in St. Johns 300 phones should cost \$33.71 each, when Cornwall's 274 phones cost only \$20.56 each annually; or why in Lethbridge 113 phones should cost \$36.83 each, when Winona's 85 phones cost only \$13.69 each per annum.

I would also point out that the rates at Windsor vary from \$20 to \$35 per annum, while the cost of operation and maintenance is \$37 per phone. The rates at Lethbridge are from \$20 to \$35 per annum and the cost of operation \$36.83 per telephone. The rates at St. Johns are \$15 to \$20, and the cost of operation and maintenance \$33.71.

Unless these statements were intended as a mere bluff to the committee, and as they form part of sworn testimony it would not be fair to assume this, it cannot be said that they reflect much credit upon the company's methods of business. Moreover, they furnish an interesting study to both stockholders and telephone users alike. I might explain also that the places referred to were selected by the company, and it is significant that although the committee called for similar information regarding points of its own selection, it was not forthcoming; this, however, was not the only instance in which the company was permitted to treat the committee's requests with contempt.

According to the report for the year ending December 31, 1904, the operating expenses amount to \$32.22 per phone, including the long distance lines. Now, referring to the statement for the ten exchanges I have named, which covers nearly one-third of the company's system and certainly those points where the operating expenses are above the average, we find the average per telephone, including long distance lines within the local limits of each exchange, amounts to \$24.80. This leaves a balance of \$7.42 per telephone, or a total of \$592,907, remaining for the maintenance of the long distance lines consisting of 32,211 miles of single wire, or \$18.46 per single wire mile per annum.

I think it will be conceded that \$24.80 per telephone per annum as a maintenance and operating expense in a company owning 390 exchanges of less than 100 lines each and only seven cities with over 1,000 telephones each, is an amount which cannot be considered a legitimate charge. Nor can it be reasonably supposed that each mile of wire on the single long distance system costs \$18.00 per annum to maintain. In fact, in Minneapolis and St. Paul the annual cost per phone per annum for 10,000 telephones is \$14.10 including operation, maintenance, taxes, insurance, stationery, and every possible expense. If I had time I could show you figures from the reports of other large Independent companies in the United States which would stand out in striking contrast to these. In my search for an explanation of them, however, I came across two circulars issued by the Boston bankers of the American Bell Telephone Company in connection with the sale of that corporation's bonds. In one of these I find among the list of the "Bell" sub-licensees

the name of the Bell Telephone Company of Canada; while in the other appears this statement:

"In operating the sub-companies an amount of from eight to ten per cent. of the capitalization is charged off yearly and is included in the accounts of such companies as a part of the operating expenses." Would it be correct to assume that this is the explanation for the excessive operating expenses of the Bell Telephone Company of Canada? If so, the public have a right to know where these hidden profits go. Do they go to the American company as a set off against the Canadian stock, which, it is stated, is purchased at par?

I have alluded to these matters because in the coming campaign the people will require to be educated upon the methods employed by the "Bell" in the conduct of its business, in order that they may come to a right decision whenever they have an opportunity to choose between an Independent service which they can control, or a corporation which, with the aid of the stockholding senators and commoners, has hitherto defied all attempts on the part of the people to bring it within reasonable local control.

In 25 years the Bell Telephone Company of Canada has expended upon telephone development in this Dominion less than \$10,000,000; yet it had the effrontery to apply last session for authority to increase its capital to \$50,000,000, which amount, at the rate of progress made in the past, it would take a century to expend. One might well ask why this sudden inspiration to increase the telephone facilities of this country did not occur before this Association was formed and before it became apparent that organized competition was in the field. Surely no better evidence is required than this in support of the charge that the telephone service has been neglected by those to whom parliament in 1880 gave autocratic powers over the legislative and municipal governing bodies of this Dominion in the matter of the use of the public highways. When we look at the records we do not wonder that this corporation is striving hard to redeem its past. But what are the facts?

The following statement showing the extent to which telephone service has been provided by the Bell Telephone Company of Canada, taken from the figures supplied to the telephone committee, will afford some indication of the immense field that is waiting the advent of Independent telephone systems:

#### Number of Inhabitants to one Telephone in Exchanges Operated by the Bell Telephone Co. of Canada.

One exchange have	over 2,000 inhabitants to one telephone.
8 exchanges have	over 1,000 inhabitants to one telephone.
11 exchanges have	750 to 1000 inhabitants to one telephone.
11 exchanges have	500 to 750 inhabitants to one telephone.
6 exchanges have	400 to 500 inhabitants to one telephone.
14 exchanges have	300 to 400 inhabitants to one telephone.
19 exchanges have	200 to 300 inhabitants to one telephone.
49 exchanges have	100 to 200 inhabitants to one telephone.
23 exchanges have	75 to 100 inhabitants to one telephone.
53 exchanges have	50 to 75 inhabitants to one telephone.
48 exchanges have	40 to 50 inhabitants to one telephone.
66 exchanges have	30 to 40 inhabitants to one telephone.
43 exchanges have	25 to 30 inhabitants to one telephone.
38 exchanges have	20 to 25 inhabitants to one telephone.
61 exchanges have	under 20 inhabitants to one telephone.

These figures are for January 1, 1905, and are calculated upon the census returns of 1901. If it were possible to make an accurate statement based on the actual population in 1905 the result would furnish more conclusive proof of lack of development. Furthermore, a large number of exchanges include rural telephones outside the area covered by the census returns, which should not be included in these figures.

Regarding rural telephone development, the "Bell" witnesses admitted that in the territory operated by the company they had only one telephone to 1,250 inhabitants, according to the rural census returns of 1901. Now when we remember that in the United States there is an average of not less than one telephone to twenty inhabitants, it will be seen how much there is for Independents to do in Canada.

In order to make a few comparisons of the systems in small places I have taken the best developed of the small "Bell" operated areas in Canada and compared them with the same number of Independent exchanges in the United States. The result is as follows:

2,000 Inhabitants.			
Telephones		Telephones	
Lockport, Ill.	481	Sudbury, Ont.	117
Fleming, Ohio	350	Richmond, Que.	108
Winchester, Kan.	240	Montmagny, Que.	85



Chagrin Falls, O.	205	Meaford, Ont.	73
Doyleston, Ohio	170	Mount Forest, Ont.	55
1,600 Inhabitants.			
Telephones		Telephones	
Wilmington, Ill.	497	Aurora, Ont.	52
Blakesburg, Iowa	250	Harriston, Ont.	48
Sibley, Ill.	197	Kingsville, Ont.	48

1,150 Inhabitants.

Telephones		Telephones	
Dundee, Mich.	197	Winchester, Ont.	60

These independent figures are taken from the returns supplied to the telephone committee by the companies operating in the places named. I am aware that there are very many points in the United States where a much higher development exists, but for the sake of accuracy I prefer to use the figures obtained by the committee from an authoritative source. I may say, however, that within the past few weeks I have visited a village in Illinois, Plainfield, having, according to the 1900 census, 920 inhabitants, which has an exchange with 578 telephones. Six years ago the inhabitants of this village considered themselves fortunate in having one "Bell" toll office in the corner drug store. How many villages in Canada are there today in the same position as was Plainfield, Ill.; six years ago.

I have been favored by Mr. E. R. Conklin, president of the Illinois Independent Telephone Association, with some statistics showing the business done by his company, the Interstate Telephone & Telegraph Company, in villages, which furnish a striking illustration of how the rural districts may be developed. They are as follows:

	Tel.	Inh.		Tel.	Inh.
Big Rock	122	350	Mokena	98	280
Coleta	191	250	Monee	152	160
Crete	293	760	Orland	181	362
Elburn	294	600	Plato Center	145	43
Elwood	205	250	Sugar Grove	136	100
Frankfort Stn	308	250	Virgil	50	50
Hampshire	324	700	Penrose	87	58
Kanaville	113	270			

I would emphasize the fact that this is the complete record of all the villages having at the 1900 census less than 1,000 inhabitants, operated by this company. Contrast this record of six years' work with that of the Bell Telephone Company of Canada which, after 25 years, has 252 exchanges with 20 subscribers and under, 170 of which have less than 10 telephones each.

Dealing with the growth of the Independent movement in some of the principal states of the union we find that:

Ohio has one independent telephone to 17 inhabitants.

Illinois has one independent telephone to 17 inhabitants.

Indiana has one independent telephone to 13 inhabitants.

Iowa has one independent telephone to 12 inhabitants.

The "Bell" figures furnished the committee for the territory served by that company averaged one telephone to 63 inhabitants.

The "Bell" counsel argued that the density of population was responsible for this growth. If this were true how does it happen that Prince Edward Island, which is operated by a "Bell" company, the most densely populated province in Canada, has the lowest development, being one telephone to 194 inhabitants? Furthermore we find that Iowa, the best developed state of the union, has a density of 40.2 inhabitants per square mile, while, eliminating the undeveloped districts of Algoma, Nipissing and Muskoka, Ontario has a density of 48.5 inhabitants per square mile. I would also add that the municipal systems of Port Arthur and Fort William, which are entirely isolated and without long distance service, have one telephone to seven inhabitants.

Last month an article appeared in the Toronto Star in which the claim was made that Toronto was the banner telephone city of this continent, and stating that the "Bell" had 17,000 telephones or one to 15 inhabitants. Now, taking the population of this city with Toronto Junction at 300,000 which is, I think, a conservative estimate, and admitting there are 17,000 telephones in operation, the average would work out at two telephones to 35 inhabitants, or one to 17½.

The following figures, which President Hoge of the International Telephone Association has kindly supplied me with, show how fallacious this claim regarding Toronto is; and will further prove with what splendid results the Independent movement has operated in the large cities of the United States:

Before competition Cleveland, Ohio, had 5,600 telephones; on July 18 last there were 23,022 independent, and about the

same number of "Bell" phones, or one telephone to nine inhabitants.

Before competition the twin cities of Minneapolis and St. Paul had 4,800 telephones; in March last there were 20,000 independent and about 22,000 "Bell"; a total of 42,000 or one telephone to 11 inhabitants. The Independent telephones are growing at the rate of 5,000 a year.

Before competition St. Louis, Mo., had 3,500 telephones; in March last there were 17,000 independent telephones and 22,000 "Bell" telephones; a total of 37,000, or one telephone to 16 inhabitants. The "Bell" phones include 10,000 "slot machines."

Before competition Los Angeles, Cal., had about 12,000 telephones; in March last there were 22,873 Independent and 20,000 "Bell" phones; a total of 42,873, or one telephone to less than three inhabitants, according to the 1900 census returns.

Returning to Toronto, the latest directory of the company only records about 12,600 in the city and junction, the balance of the 17,000 being apparently desk and private extension phones, the number of which there are no means of checking. We will, however, admit that the company has done well numerically in this city, but let us look at the reason for this development. It will be remembered that after the company's franchise expired in 1896, notwithstanding an "order in council" of parliament, an endeavor was made to increase the rates, rentals varying from \$55 to \$150 per annum being asked for connections within the city limits. But what happened? In 1898 an agitation was commenced for the establishment of an Independent system, which was followed in 1900 by a proposal by Alderman, afterward Mayor, Urquhart, to install a municipal exchange. Since that time there has not been a year without an offer being made to the city to establish a competitive system; and I may be pardoned for saying that the city has, to its discredit, used these offers as a sword of Damocles over the head of the Bell Telephone Company, and kept it in a state of fear and trembling for the last seven or eight years. How long is this state of affairs to last; and, what is more important to the citizens, how long do you suppose the present rates will remain in force? The answer is, until the company has satisfied itself that it is secure against competition; not a day longer. Unless the city council decides to admit competition at an early date, the company will grow tired of the cry of "wolf, wolf." When that time arrives the company will defy the city in regard to rates just as it has in the disfigurement of the streets; and while our city fathers are caving in to the best way out of the difficulty, subscribers who cannot dispense with their 'phones will be coerced into signing long term agreements at increased rates, thereby incurring a loss to the citizens of possibly over \$100,000 annually. While on this point I may say that I do not believe that the granting of a public utility franchise such as the telephone service, should be finally decided by any other means than that of a by-law voted upon by the people. Further than this I do not think it is the wish of the people that the Bell Telephone Company should be allowed to retain a monopoly in this city. Evidence of this is to be found in the fact that council after council have not had the courage to grant a "Bell" franchise, although by their inaction they have virtually given a monopoly for the last eight years. Surely it is time that our civic legislators let the people know where they stand in regard to this important question.

There never was a time when the Bell Telephone Company of Canada was striving so hard to redeem its past as the present. But do not be misled:

"When the devil was sick, the devil a saint would be;

"When the devil was well, devil a saint was he."

Remember that this Dominion is the last stand in the telephone fight on this continent. The "Bell" forces have been outclassed and put to rout in the United States. They know this, and you may depend upon it that no assistance will be lacking on the part of the American Telephone and Telegraph Company in an attempt to stem the tide of the Independent movement in Canada. If therefore, this association and this movement is to be successful, the enemy must be given no quarter. You cannot serve two masters. You cannot hope for success if you do not remain absolutely independent. Now is the time to raise your standard and live up to it. Do not, on any terms, enter into working contracts with the "Bell," for the moment you do so you become a part of that system, forfeit your independence and defeat the very object for which your system was created. Be assured that in making overtures to you the "Bell" does not want your business; it is only plotting to effect your ruin, and then what will happen? Ask the farmers in the eastern townships of Quebec, the fruit growers on the Niagara peninsula, and others how they have been treated after relinquishing control of the lines which they had built? Be patient and in a

little while, if you are true to your principles, the Independent movement will provide the facilities you are now lacking, even as it did in Indiana, Illinois, Iowa, Michigan, Ohio and other states of the Union.

There is a present demand in Canada for approximately half a million telephones, and I need hardly to remind you of the rapidity with which the population is being augmented by new arrivals. Since the last census 580,000 persons have landed upon our shores, and it is said that Sir Wilfred Laurier claims 2,300,000 people will have settled in this country five years hence. Other estimates place the western population of 1921 at ten millions, and prophesy that in 1931 this Dominion will have twenty-five million inhabitants.

Independent telephone men of Canada, I have endeavored to show you the immensity of the field that lies before you, and the vast possibilities which exist for providing an adequate telephone service in this Dominion. This field is yours if you enter upon the work with courage and a determination to succeed. Do not be discouraged. As the work proceeds, the public become better acquainted with your methods, they will appreciate the benefits of the service you are providing, and will give you the same measure of support as that enjoyed by the Independent companies across the border, until the sign of the Canadian Independent Telephone Association will be found in every city, town and village from the Atlantic to the Pacific. Do not, however, imagine that the telephone is immune from those conditions which are common to any other business. It requires capital, energy and wisdom to develop it. If you want the business you will have to build it up. It rests with you to educate the people into the benefits resulting from a good telephone service, and when you have so educated them, see to it that you carry out your contract and maintain the service at the highest possible standard of efficiency.

It is true that the "Bell" is first in the field, but its 25 years' record is such that you need have no doubts about passing them on the road. You cannot expect to do so in a day or a year; it took longer than that in the United States. Remember that unswerving allegiance to the cause you represent, and to each other, is absolutely essential to your success. Keep your ranks unbroken. Do not allow small differences, petty jealousies or rivalries to defeat the object you have in view. Realize that no individual concern can handle all the telephone business in this country. If you have differences about any particular territory, settle them amicably in private and so avoid appearing as rival factions in public. If you require advice or assistance consult with the executive of your association, and do not forget that if there are any problems too difficult for it to solve, the International Association is always ready to come to your aid.

In conclusion, it is a "long pull, a strong pull, and a pull altogether" that wins the race. Let this be the motive to carry forward the Independent telephone movement of this vast Dominion and your efforts will be rewarded with a measure of success far exceeding your anticipations of today.

### New York Meeting a Success.

The New York State Independent Telephone Association held its annual meeting at Niagara Falls on September 3. Nearly 300 delegates and manufacturers participated in the banquet, the business sessions being equally well attended. Among the important committees appointed was one to provide a map of all the telephone lines of the state, with comparisons between the Independent and Bell lines. A committee was also appointed to confer with the management of the different railroads operating in the state, with a view to installing the equipment of the Independent lines on the railroad property and securing agreements with the railroads. A committee was also appointed to consider the advisability of having the state association unite with the national association.

Officers were elected as follows: President, Dr. W. R. Campbell, Niagara Falls; vice-president, C. N. Cowie, Syracuse; secretary, Max R. Eaton, Niagara Falls; executive committee, B. G. Hubbell, Buffalo, president of

the Consolidated Telephone Company; Edward Davis, Philadelphia, president of the York Telephone Company, of Elmira; S. B. Rawson, Albany; M. R. Charles, Schenectady; C. H. Poole, Utica, manager of the Utica Home Telephone Company; M. H. Fleuher, Auburn, of the Auburn Telephone Company; I. H. Griswold, Albany, of the Albany Home Telephone Company, and George R. Fuller, of Rochester, president of the Rochester Telephone Company.

Several interesting papers were read which will be presented in full in subsequent issues.

### Railroads Must Use Telephones.

The State Corporation Commission of Virginia has issued orders to all the railroads in the state to maintain telephones at every passenger and freight station, in accordance with a law passed last winter. The law is mandatory and took effect September 1. Its principal provisions are as follows:

"1. That it shall be the duty of every railroad company having a ticket office or freight office in any city or town of this commonwealth where there are, at the time, one or more public telephone exchanges, or at any place where telephone connection may be had, on reasonably moderate terms, with one or more telephone exchanges not more than twenty-five miles distant from each place, to constantly maintain in each of such offices direct telephone connection with each of such exchanges; but nothing herein contained shall be construed to require such railroad company to build a telephone line, it being intended to require such company to put telephones in its offices where it can obtain them as they may be obtained for other business offices in the same vicinity; such railroad company shall cause to be promptly answered all calls made over such telephone connection during business hours. Through such telephone connection, such railroad company shall cause prompt and correct replies to be made to all reasonable and proper inquiries received over such connection during business hours, concerning the passenger or freight service of such road.

"2. The term business hours, as used in this act, shall be construed to mean such times as the office or depot be open, with an officer or agent of the railroad company in charge, for the transaction of business.

"3. The State Corporation Commission shall by proper orders and requirements, and by the infliction of suitable penalties, enforce the performance of the foregoing duties by each railroad company doing business in this state; provided, that the State Corporation Commission may, on the application of any railroad company, after such notice as the said commission may direct, excuse such company from placing a telephone in any office, depot or place where, in the opinion of the commission, the public convenience does not require it."

### Bell Defeat in Canada.

James Connec, M. P., has made an official statement that the new Canadian telephone law opens railroad stations to Independents. The Canadian Pacific road has an exclusive contract with the Bell company, which, however, is made void by the new act. Municipal phones will be placed in the C. P. R. stations at Port Arthur, Fort Williams and other points as soon as the towns have made terms for the service. In other localities where Independent companies are doing business their phones will be on equal terms with those of the Bell monopoly.

# The Law and the Telephone

By GEO. H. MURDOCK, JR.

A controversy between the Queen City Telephone Company and the city of Cincinnati, which had already been through three courts, has just been decided by the Supreme Court of Ohio adversely to the company.

The litigation was commenced by a petition filed by the company in the Probate Court, in which it was alleged in substance that the company had made application to the council of the city to prescribe the manner of use by it of the streets, alleys, public ways, and other public property of the city in constructing its lines of telephone and telegraph, and transmitting at the same time the form of an ordinance that the plaintiff was willing to accept and bind itself to perform and conform to; that a committee to whom the application was referred reported to the council that there was not room in the streets of the city for the accommodation of the lines asked for, and that it was inexpedient to make any grant or agreement, which report was adopted, and thereupon the city finally rejected the application; although the company has been and is willing to accept the permission upon any terms and conditions prescribed by the council that may be proper and lawful for it to prescribe, or to accept any amendment which might be lawful and proper to the proposal presented by it.

The Probate Court found for the company, and proceeded to direct the mode for the use of such streets, decreeing that upon certain designated streets, and in such other thickly settled portions of the city as the company might from time to time select, all its wires should be placed in underground conduits or subways, and no poles should be erected in said district or other portions of the city where the wires are placed in conduits, except for distribution of wires or cables from conduits to buildings, and all such poles should be, as far as possible, located in alleys; and further provided for the erection of the poles and wires in other portions of the city, with authority to the company to construct all conduits, etc., in such manner as to make its system a complete working system of telephonic communication.

This judgment was reversed in the Court of Common Pleas, which latter judgment has been affirmed by the Circuit Court and now again by the Supreme Court.

The gist of the decision of the latter court is that the statutes of Ohio do not confer power on the Probate Court to grant to a telephone company the right to put its wires and apparatus in conduits under the streets of a city in the absence of consent by the municipal authorities. A part of the opinion, which was written by Justice Spear, is particularly interesting as in it he adds to and explains another important telephone decision, also written by himself. That part of the opinion referred to is as follows:

"It is, of course, conceded as now well settled, that the general power to occupy the streets of a municipality by a telephone company is derived from the state, as held in *Zanesville vs. Telephone Co.*, 64 Ohio St. 67, 59 N. E. 781, and *Farmer vs. Telephone Co.*, 72 Ohio St. 526, 74 N. E. 1078. (Referring to this last case, it may not be amiss here to remark that on page 532 of 72 Ohio St., page 1080 of 74 N. E., the types make the writer say that the Probate court is a substitute in all respects for the municipal authorities. This was not intended. The

words "as to rates," which should precede the above statement have dropped out. Without them the statement is too broad.) But taking the sections of the statute as a whole and considering the conditions imposed on the exercise of such right, it is not to be inferred that the municipal authorities are stripped of all power to finally determine any matter relating to the general subject. It will be remembered that by section 2640 those authorities are given control of the streets and are required to keep them open, in repair, and free from all nuisance. It is to be noted, also, that by no statute is power given any tribunal to authorize permanent structures upon or in, or the use of any street, which will incommode the public; the dominant purpose being to facilitate public travel and transportation. *Railway Co. vs. Tel. Ass'n*, 48 Ohio St. 390; 27 N. E. 890; *L. S. & M. S. Ry. Co. vs. Elyria*, 69 Ohio St. 414, 69 N. E. 738. It seems, therefore, clear that there is no power in the Probate Court to authorize or direct the construction of conduits in subways under the streets of a city in the absence of consent by the municipal authorities.

*Queen City Telephone Co. vs. City of Cincinnati*, 76 N. E. 392.

## INJURIES TO PEDESTRIAN.

William C. Guinn, a lad thirteen years of age, was killed by contact with a guy wire charged with electricity, and an action was commenced against the Delaware & A. Telephone Co., by his legal representative to recover damages. The wire was of a character used for telephone construction, copper wire of a tensile strength of 250 pounds. It was attached to a pole on which was strung wires of the defendant alone. There was no proof except by inference that the defendant erected or owned the pole or had attached the wire. In answer to an inquiry, the defendant stated that the wire had been inspected May 27 or 28, about three weeks before the injury. No testimony was offered by the defendant. The trial judge left it to the jury to say whether the wire was put there by the servants of the defendant, and a verdict was rendered against the company. The injury was caused by the guy wire breaking and falling on an electric light wire belonging to another company. The broken end fell in the grass in a field belonging to one Gulick. Across this field people were accustomed to travel without objection, but as far as appears without other right. The boy's body was found still in contact with the guy wire shortly after the shock. It does not appear that he had any right to be on Gulick's property, except such as may be inferred from the facts stated. The contention of the defendant is that it was under no duty to the decedent for the reason that he was a trespasser on Gulick's property or at best a mere licensee. The New Jersey court of errors and appeals, in reviewing and affirming a judgment for the plaintiff, says:

"The liability of the defendant rests upon the fact that it was maintaining wires which might become charged with a deadly current of electricity.

"The duty to exercise care is established as to travelers upon the highway and employees of defendant or another company who in the exercise of their rights are

likely to come in contact with the wires, and of persons who are lawfully in a place of proximity to the wires. The question presented in this case is whether the duty exists as to third persons who are not at the time in the exercise of any legal right. The principle underlying the case is stated by Chief Justice Beasley, in *Van Winkle v. American Steam Boiler Company*, 52 N. J. Law, 240, 247, 19 A. 472, to be that in all cases in which any person undertakes the performance of an act which, if not done with care and skill, will be highly dangerous to the persons or lives of one or more persons, known or unknown, the law, ipso facto, imposes as a public duty the obligation to exercise such care and skill. The test of the defendant's liability to a particular person is whether injury to him ought reasonably to have been anticipated. In the present case, the guy wire was stretched over on open field across which people were accustomed to travel without objection by the landowner. The adjoining field was used as a ball ground. It was probable that, if the guy wire broke, some one crossing the field would come in contact with it. That whoever did so was a trespasser or a bare licensee, as against the land-owner, cannot avail the defendant. If a bare licensee, he would still be there, lawfully. If a trespasser, his wrong would be to the landowner alone, not a public wrong, nor a wrong to the defendant.

"The general rule is that a person is liable for those results of his negligence which are reasonably to be anticipated, the exemption of the landowner from liability as to trespassers and licensees is necessary to secure him the beneficial use of his land; but no reason exists for ex-

tending this exemption to the case where the rights of the defendant have not been interfered with. There is no proof that the defendant had any right to maintain the pole and wire; but, even if it had, the deceased is not shown to have interfered with the defendant's rights. The right to maintain the pole and wire did not involve the right to have the wire swing loose or occupy another portion of the field. Whoever interfered with the pole and wire in place, might be a trespasser, but he would not be a trespasser upon the defendant's rights if he came in contact with the wire elsewhere.

"The trial judge in his charge rested his refusal to nonsuit upon the theory that the defendant had no right to stretch the guy wire, and he therefore refused to charge that the mere fact that the boy was there as a licensee defeated the plaintiff's right to recover. We think that even if defendant had a right to stretch the guy wire, the plaintiff might still be entitled to recover. There was no error in the refusal to charge. The judge was asked to charge that the jury must be satisfied with the greater weight of the testimony that the defendant company was negligent, or the verdict must be for the defendant. He charged that it must appear by the weight of probabilities that the defendant's servants put the guy wire there. He then left it to the jury to say whether the defendant was negligent in doing something which it did, or in leaving undone something which it should have done."

*Guinn v. Delaware & A. Telephone Co.*, 62 A. (N. J.) 412.

## Four-Party Lines

By J. A. GUSTAFSON

Every exchange manager or solicitor in canvassing for new subscribers has interviewed a large number of people that would like to enjoy the advantages of a telephone but do not feel able to pay the regular rental price of a private line. This class of business in most exchanges has been handled on party lines at a slight reduction in price, but the constant ringing of bells and listening in on the line by the neighbors, makes it unsatisfactory to the subscribers as well as to the manager. Thus the demand has been created for an apparatus or method whereby one individual can be signaled without the other stations on the line receiving the call. There are several different selective systems in use for four-party line service, the harmonic or tuned ringers being the best undoubtedly for central battery exchanges or those large enough to justify the installation of the expensive equipment necessary for its operation. On small magneto exchanges telephones using bias ringers have been found to work quite satisfactory and four-party lines can be installed at a nominal cost. This is the system that I will take up, giving a brief outline of its construction, hoping that it might be of some interest to those who have not investigated its mechanism. Metallic lines must be used for this work and the bells are actuated by positive and negative pulsating currents. These instruments can easily be made up in the shop from regular series phones by removing the eighty ohm ringer and substituting a twenty-five hundred ohm, wiring one side of

this ringer to an outside binding post and the other side to the center binding post. It is preferable to use a pair of cords for this with tips so that these connections can easily be reversed if the phone is to be changed to another station that requires an opposite current. Attach a biasing spring to one side of the armature so as to hold it against the core of one coil when it is at rest in such a manner that the tension can easily be adjusted. The ringer will now operate by direct pulsating current. The polarity of the current necessary for its vibration can be determined by testing with a cell or dry battery. Connect the generator to the two outside lines binding post, using a button in the circuit to cut it out when not in use. A condenser in series with the receiver circuit will be of help when a subscriber calls for a party on the same line and it is necessary to ring back. This will complete your telephone. In connecting up the instrument to the lines, connect the left binding post to the tip side of the line and the right binding post to the sleeve side of the line. The middle binding post is for the ground wire. One positive and one negative ringer should be connected to the tip side of the line and one positive and one negative to the sleeve side, the ground acting as the other side for all of the bells. These lines should terminate at central on a low wound drop, say from forty to fifty ohms. The function of this low wound drop is to consume enough current from the generator of a party calling the exchange so that the other ringers on the same line will not



be operated. The ringing power at the central office can be supplied from a good pole-changer wired to produce positive and negative pulsating currents or by a power generator with commutators. The side of the generator or pole-changer that is common to both alternating and direct currents, should be grounded. A master key is placed at each operator's position. Any reliable make of keys having two levers that can each be thrown backwards and forwards and will remain locked in either position until restored, can be used for wiring up this master key, providing they have a sufficient number of springs, and contacts so that in throwing a lever one way positive current will be sent out on the tip side of the line and throwing it in the opposite direction, negative current will be sent on the tip side, likewise the other lever is to

give positive or negative current on the sleeve side of the line and when both levers are in an upright position, alternating current is restored to the regular ringing circuit. This master key is connected to the strap wires which are common to all of the regular ringing keys in an operator's circuit so that any cord circuit can be used in calling or simply throwing the master key in the desired position and ringing with the regular key. The master key should also be wired in such a manner so that if the ringing is done on the tip side of the line the sleeve side will be grounded, and vice versa. The simplicity of this system and the small amount of apparatus necessary for its installation makes it especially suited to small magneto exchanges.

## Necessity of a Bureau of Statistics

By H. W. MARTIN

A recent report on telephone statistics, published broadcast throughout the country accentuates the necessity of the Independent companies immediately establishing a statistical department. The report mentioned gives a very unfair account of the progress of Independent telephony and in fact, the whole bears the ear mark of the Bell company. From this report one is given the idea that, with the exception of fifty or sixty thousand instruments the Bell company is running things. Evidently the census bureau has taken the statistical reports of the Bell company and has guessed at the rest or taken the word of the Bell company.

If the Independent companies were to establish a bureau for the collection of all kinds of information, the government would then have no possible reason for ignorance. If there are no more than fifty thousand Independent telephones in use, what has become of the half million or more telephones that have been sold by Independent manufacturers each year for the past ten years? Philadelphia, Cleveland and St. Louis will aggregate considerably more than fifty thousand to say nothing of Buffalo, Minneapolis, St. Paul, Pittsburg, Baltimore, Columbus, Indianapolis, Kansas City, Los Angeles, Rochester and many hundred smaller systems. A true report would show fully twice as many Independent telephones as the Bell.

The Bell company has a very efficient department devoted to the collection of all manner of data concerning telephony and while they are not giving secrets away to the public, they are not slow to publish information that may be to their advantage. If each independent telephone operating company were to send complete information to a statistical department regarding its business as well as the Bell's there would be a good chance to show a comparison that is truthful.

It has been found that a directory list published by the Bell company is generally full of dead names. It is their custom to get out a good fat directory so as to make a good showing. Chances are that the Bell Telephone Co. make their reported figures of the number of telephones in use, to agree with the number of the last transmitter or receiver sent out, not taking into account those that have been returned or that are out of use. A report such as that published by the government has a great deal of weight with the capitalist. He will not care to invest his money unless he can be shown a pay-

ing proposition. The report certainly is absurdly inadequate for the Independent companies and the Bell company are taking full advantage of it. Such a snap certainly does not come to it every day; in fact it looks very much like a home-made snap. The Bell company is certainly not going to minimize any report of its own importance or magnify any thing favorable to the independents.

Suppose exact figures showing the rate of increase of the Independent companies were at hand and at the same time reports showing how competition has affected the Bell in towns where both companies exist, there would be some very surprising reports to publish in towns where new companies are endeavoring to secure franchises.

This matter of having facts and figures to present for publication is extremely important. Our opponents have them and are willing to pay for their publication if necessary. They are so "slick" about it that many papers publish their stuff thinking that they are actually doing a great service to the Independent cause. The National Interstate convention should take up this subject at once and settle it. Dollars will be returned where cents were spent.

Suppose that each independent exchange in the United States was to make a business of collecting all manner of data concerning the Bell company in its territory as well as figures showing its own standing; carefully noting all moves that are made, and send all of this information to the bureau of statistics for tabulation. A few reports will not do and there would be no material value to them; but where all exchanges co-operate, there would be an accumulation of great value.

When any exchange had a fight on its hands it could draw from the fund of information available and get an abundance of help. It would be a case of fighting the enemy with his own devices. All items published in the home newspapers regarding telephone subjects should be collected and sent to headquarters for by so doing it will frequently be possible to circumvent some move made by the publicity department of the Bell company. It stands to reason that this same literature has been used for similar purposes at some other place, and knowing what ammunition has been used successfully for defense in one place, similar measures may be used in another.

# Personal and Field Notes

THE WAMEGO TELEPHONE COMPANY, Wamego, Kas., is making improvements and extending its lines.

THE HOME TELEPHONE COMPANY, Bellingham, Wash., is erecting a handsome new exchange building.

THE KEYSTONE TELEPHONE COMPANY will establish a new trunk line between Philadelphia and New York.

THE ZEANDALE HOME TELEPHONE COMPANY, Zeandale, Kas., is doing considerable extension work at present.

THE KELSO TELEPHONE COMPANY, Illmo. Mo., of which E. S. Fassett is general manager, has increased its capital stock from \$5,000 to \$10,000.

THE TORAH TELEPHONE COMPANY, Torah, Minn., of which R. T. Zempel is secretary and treasurer, has two rural lines under construction.

AT NORTHVILLE, S. D., the South Dakota Union Telephone Company has been organized with an authorized capital of \$50,000.

AT DUNLAP, ILL., Walter Alten and Oscar Alten have organized the Dunlap and Alta Telephone Company. The authorized capital is \$10,000.

A FINE PIECE OF PROPERTY has been purchased by the Richmond Home Telephone Company, Richmond, Ind., for the purpose of erecting a modern, fire-proof building, to be used for telephone purposes exclusively.

AT JULIAN, NEB., George F. Conlon and others have incorporated the Farmers' and Merchants' Mutual Telephone Company with a capital stock of \$5,000.

J. H. GAITHER, formerly chief engineer and general manager of the Atlantic Coast Construction Company, Suffolk, Va., is now located at Greeley, Col.

FROM THE CITY OF DE PERE the Fox River Valley Telephone and Telegraph Company, Green Bay, Wis., is extending its lines south, west and southwest.

AT DONIPHAN, MO., the Ripley County Farmers' Telephone Company has recently been organized, with J. F. Klevin as president and Charles P. Booker as secretary.

THE LEXINGTON TELEPHONE EXCHANGE, Lexington, Neb., is building a new exchange building which will be two stories high and of cement block construction.

THE YOUNGSTOWN TELEPHONE COMPANY, Youngstown, O., is cabling the town of Lowellville, O., preparatory to moving into a new exchange in that place.

THE BAY SHORE TELEPHONE COMPANY, Green Bay, Wis., has been incorporated by Henry F. Hagemeister, F. J. B. Duchatcan and C. A. Straubel. Capital, \$10,000.

THE HOME TELEPHONE COMPANY, Hamilton, O., owned an automobile until recently when it blew up and set fire to the company's warehouse, causing a loss of \$2,500.

THE NORTHWESTERN TELEPHONE COMPANY, Creston, Ind., has completed its exchange at Lowell and St. John's and is now planning several extensions to its system.

THE YORK STATE TELEPHONE COMPANY, Binghamton, N. Y., has completed a trunk line of 80 miles to Syracuse, and a similar line to Scranton, Pa., is nearing completion.

A MORTGAGE FOR \$50,000 has been filed by the Mt. Pulaski Telephone and Electric Company, Mt. Pulaski, Ill. The money will be expended for extending the company's system.

THE PEOPLE'S TELEPHONE COMPANY, Leaven-

worth, Kas., is putting in a new central energy system and will put all its wires underground in the business part of the city.

THE LARGEST ISSUE of industrial bonds offered for sale to Wall street since the first of the year is that of the American Telegraph and Telephone Company for \$100,000,000.

WALTER B. ROGERS, manager of the Waverly Telephone Company, Waverly, Ill., has received the nomination for assessor and treasurer for Morgan county on the Democratic ticket.

THE WOMEN TELEPHONE OPERATORS of Chicago have been asked by the Woman's International Label League to form a union to be affiliated with the American Federation of Labor.

THE INGERSOLL TELEPHONE COMPANY, Ingersoll, Ont., has been incorporated with a capital stock of \$50,000. A. J. Welch is president of the company and E. H. Hugill secretary.

THE TELEPHONE PLANT at Palmyra, Mo., is now owned by William Lind, of Quincy, Ill., who purchased the property from C. A. McComb for \$8,000. The entire plant is to be rebuilt.

THE CITIZENS' TELEPHONE COMPANY, Kokomo, Ind., has passed into Bell control after two years of scheming on the part of certain financiers who were interested in perfecting the alliance.

SECRETARY A. B. COX of the North Dakota Independent Telephone Company, Fargo, N. D., has been granted permission to use all the highways in Stutsman county for telephone purposes.

L. A. RICHARDSON, formerly general superintendent of the Twin City Telephone Company, Minneapolis, now is general manager of the North Dakota Independent Company, with headquarters at Fargo.

THE WINONA TELEPHONE COMPANY, Winona, Minn., of which Otto Troost, Jr., is manager and secretary, now controls four branch exchanges—at Rushford, Lanesboro, Lewistown and Rolling Stone.

A METALLIC TOLL LINE has been built by the Spencer County Home Telephone Company, Rockport, Ind., between Rockport and Grandview. The work was done under the management of A. J. Payton.

M. B. KELLOGG and other progressive citizens of Medford, N. D., have organized the Medford Mutual Telephone Company. A small start will be made, but the prospects for rapid additions are good.

Z. B. MCCARVER, who was for seven years with the Southwest T. and T. Company at Denison, now is general superintendent of the North Texas Independent Telephone Company, with headquarters at Whitesboro, Texas.

THE CHISAGO COUNTY TELEPHONE COMPANY has been incorporated at Center City, Minn., by A. B. Slattengren, of Center City, and Charles Andrews, of Lindstrom, with an authorized capital of \$50,000.

THE ENTIAT T. AND T. COMPANY has been incorporated at Waterville by Frank E. Knapp, D. M. Farris and P. M. Martin of Entiat, Wash., west of Spokane. The company will operate in the Big Bend country.

CITIZENS OF LUDLOW, ILL., and surrounding country have organized the North Harwood Telephone Company, with an initial capital of \$2,100. The incorporators are W. T. Jackson, C. E. Arnold and J. F. Kirk.

THE WAVERLY TELEPHONE COMPANY, Waverly, Ill., has rebuilt its exchange at Franklin, Ill., and moved into its

new quarters there. The improvements consist of underground and aerial cable and 280 new telephones.

SECRETARY EDWARD BLINNE of the Ballwin Mutual Telephone Company, Ballwin, Mo., states that the capital stock of his company has been increased from \$2,000 to \$5,000 and that some extensions are contemplated.

A FINE CABLE PLANT is being installed at Manchester, Iowa, by the Delaware County Telephone Company. The same company has recently purchased the exchange at Lamont, Iowa, and made extensive improvements there.

THE ST. CLAIR TELEPHONE COMPANY, St. Clair, Minn., has been incorporated with a capital of \$10,000. A local exchange will be built at once and building of connecting rural lines is now under consideration. H. Thielman is president of the company and Charles O'Connor secretary.

THE BOARD OF DIRECTORS of the Tri-State Telephone and Telegraph Company, Minneapolis, Minn., has declared the 13th quarterly dividend on the preferred stock of the company at the rate of six per cent. per annum.

C. F. TONN, JACKSONVILLE, ILL., is building an up-to-date line for the North Fulton Telephone Company, Lewistown, Ill. Mr. Tonn is an experienced telephone man who will give good service to the people of Fulton county.

THE INDEPENDENT TELEPHONE COMPANY has secured a franchise at Pasco, Wash., south of Spokane, and will put in an exchange, which will have long distance connections. R. A. Klinge holds the franchise for the local system.

THE IOWA TELEPHONE COMPANY, in order to meet Independent competition has reduced its residence phone rate at Des Moines and cut out four party lines. And yet there are people in that town who howl against the "dual" service.

THE CITIZENS OF MORGAN PARK, a suburb of Chicago, are fighting to prevent the Chicago Telephone Company securing a ten-year franchise extension. The concessions offered by the company are called "gold bricks" by the citizens.

CHARLES WHEAT, the new manager of the County Home Telephone Company, Quincy, Ill., proposes to reach every house and village residence in Adams county and connect them with the Quincy Home Telephone Company's exchange.

GENERAL MANAGER R. E. Haynes of the Independent Long Distance Telephone Company, Boise, Idaho, now is in charge of exchanges at Caldwell, Payette and Boise and 50 toll stations. He reports the Independent movement in the west to be in elegant shape.

THE STATE OF IOWA, according to official reports, has 138,818 Independent telephones and 27,268 Bell telephones. The state has 22 per cent. of the rural telephone lines of the United States and more farmers are using telephones than in any one state in the Union.

AMONG THE NEW MISSOURI COMPANIES is the Creve Couer Mutual Telephone Company, Creve Couer, Mo., with branch exchanges at Chesterfield and Baldwin. John D. Pfister is president; Albert A. Koch, secretary, and A. A. Deschamp, manager.

THE INDIANAPOLIS TELEPHONE COMPANY has a new central office switchboard, having an ultimate capacity of 17,600 lines, with 8,000 lines equipped. The new board, with the north and south exchanges, gives the company an ultimate capacity of 23,600 lines.

CONSTRUCTION WORK has been begun by the newly-organized Sarpy Mutual Telephone Association and a complete system will be installed at Richfield, Neb. The capital stock of the company is \$25,000. Ernest L. Ireland, South Omaha, Neb., is secretary of the company.

WORK ON THE NEW TOLL LINE of the Home Telephone Company, Hopkinsville, Ky., has been resumed and about 60 men, divided into several crews, are at work. The line from Paducah to Madisonville, Ky., is now connected, giving Paducah direct connection with Louisville.

THE COUNCIL OF NIAGARA FALLS, ONT., has been asked for a telephone franchise by the Stark Telephone, Light and Power Company of Toronto. The company offers a free fire alarm system, ten city telephones free, a house rate of \$18 and an office rate of \$36 per year.

THE FARMERS OF GRACE, Wright and Hamilton counties, Iowa, are about to engage in the raising of telephone poles. A farmer living near the town of Allison recently sold 1,000 poles at \$1.15 a piece, and the farmers claim there is more money in poles than in grain or cattle.

THE CHAPMAN TELEPHONE COMPANY, Newman, Ill., has completed arrangements with the Wabash Valley Telephone Company, Chrisman, Ill., to put in a toll line between the two places. This line will connect a number of Independent companies in Edgar and Douglas counties.

THE CHAMBERLAIN TELEPHONE COMPANY, Chamberlain, S. D., is extending its lines west of the Missouri river, keeping in advance of railroad construction an average distance of 40 miles. The company is controlled by J. W. Sanford, John H. Keele and W. L. Montgomery.

AN INJUNCTION HAS BEEN ASKED against the Chicago Telephone Company by the Live Stock Trust and Savings Bank, Western Life Indemnity Company and other Chicago business houses to prevent the Bell people from interfering with the use of special extension telephone apparatus.

THE INDEPENDENT COMPANY has its chief engineer, H. A. Zahm, in the Big Bend country, south of Spokane, Wash., looking over the field with a view to putting in a line to compete with the Sunset Telephone company, in which event the farmers' lines will probably pool their interests.

MUNICIPAL TELEPHONY seems to be a success at Port Arthur, Ont. The town exchange has just been extended to the hamlet of Hymers. The poles of the Canadian Northern railway are used, for which concession the railway company has free use of the phones it needs for its own business.

THE STATE OF INDIANA now has 435 Independent telephone systems, a gain of 55 over 1905. Of these 75 are unattached lines, partnerships and individually owned systems, which do not report to the state board of tax commissioners. Only eight Bell companies reported to the tax board.

THE GIRL OPERATORS in the Title and Trust exchange of the Chicago Telephone Company struck the other day because the management wanted them to enter the building through a disreputable alley. Of course, the girls won and the company had to apologize to the public for its uncalled-for action.

THE PEOPLE'S TELEPHONE COMPANY, Akron, O., is erecting a new exchange building and announces that by January 1st it will have installed the automatic system. William Christ, of Akron, and E. W. Moore and J. R. Nutt, of Cleveland, are the principal owners of the Akron company.

AN ITEM TO THE EFFECT that George H. Pierce had been appointed manager of the Knox County Telephone Company, Vincennes, Ind., has been published in several journals. Mr. Pierce never had any connection with that company whose affairs are under the able management of W. H. Moore.

THE CITIZENS' TELEPHONE COMPANY, Reed City, Mich., has purchased a lot and is about to erect a fine exchange building which, when completed, will be equipped with the latest apparatus. Under the management of C. F. Marshall the company is building and extending rural lines in every direction.

IN SAN FRANCISCO, CAL., the Home Telephone Company of California has been incorporated with a capital of \$20,000,000, of which \$300,000 has been subscribed and \$30,000 paid in. The company will operate north of the Tehachia range. John Van Linn, San Francisco, is the director of the enterprise.

FRANCIS DAGGER, former telephone expert for the Dominion government and until recently a resident of Toronto, has removed to Winnipeg, Manitoba, whither he was called by Attorney-General Colin Campbell, who is deeply interested in the establishment of a provincial telephone system and municipal exchanges.

THE PEOPLE'S TELEPHONE COMPANY, Sherbrooke, Quebec, now has 960 instruments in use and is growing constantly. Its officers are Col. E. S. Bernard, president; C. J. Wright, secretary, and C. Skinner, manager. The company operates eight branch exchanges and has four Independent toll connections.

C. A. HOAG, WATERVILLE, WASH., and a party of Chelan men have just secured a franchise for the construction of a telephone line from Chelan Falls to Lakeside, 25 miles west from Spokane. The line will also be built up the Columbia river and will have long distance connection with the Pacific States line.

A TELEPHONE EXCHANGE should be priceless when the Bell is the prospective buyer. Business secured on the pledge of Independent service in its most complete sense should be treated as an inviolable trust. These sentiments were expressed in a recent interview by a stockholder in one of Missouri's most successful Independent companies.

A. K. DETWILER, who has been granted an Independent Telephone franchise in San Francisco, states that his company is now ready to begin construction work. A switchboard with a capacity of 15,000 will be installed. The plant will have an ultimate capacity of 80,000. It will take about two years to complete the work now arranged for.

WENATCHEE, WEST OF SPOKANE, has a lively telephone war, and as a result the Pacific States Telephone and Telegraph company is making contracts to furnish instruments to subscribers outside the city at \$1 a year. Prior to the organization of the Farmers' Telephone company the charge was \$2.50 a month, which was afterward cut to \$1.50 and then to \$1 a year.

A JACKSONVILLE (TEXAS) MINISTER recently married a couple over the telephone. He had just returned from a funeral and was too tired to go out into the country to make the two young hearts beat as one. The license was read to the minister over the wire by a third party after which the enterprising preacher obligated the bride and groom and tied them hard and fast.

THE LOUISE TELEPHONE SYSTEM, Crystal City, Manitoba, is now connected with Clearwater and Snowflake and a line to Pilot Mound is just about completed. U. S. Jory, the secretary and treasurer of the company, is a typical representative of the Independent movement in the Dominion, who has made his lines popular and successful by giving excellent service at reasonable cost.

INDEPENDENT SERVICE between Western Illinois and Iowa is now an accomplished fact. The line across the Mississippi river at Burlington, Iowa, was completed in August. Instead of crossing the river by means of a cable, a large steel tower was erected on the east side of the river and the wires stretched to a stay on the Iowa side. The work was done by the Mississippi Valley Telephone Company.

AT TRENTON, N. J., the Interstate Telephone and Telegraph Company has been incorporated by Harry R. Swartz, Charles W. Wright, Richard C. Chamberlain and John A. Mac Cellish, with a capital of \$600,000. The principal offices of the company are located at 18 South Stockton street, Trenton. The company has taken over the property of the old Interstate which was purchased by W. S. Hancock under foreclosure proceedings for \$575,000.

NEW LONG DISTANCE CIRCUITS have recently been completed from Indianapolis to Thorntown, Tipton, Elwood, Logansport, Bedford and Gosport, Ind., a total of 385 miles. Additional circuits are now being established to Wabash, South Bend, Huntington, Ft. Wayne, Muncie, Kokomo and Anderson. When these circuits are completed the New Long Distance Company of Indiana will have 80 toll circuits entering its Indianapolis switchboard.

THE INDEPENDENT TELEPHONE MEN of Maine recently met at Lewiston and perfected an organization by electing the following officers: W. H. Park, Portland, president; M. L. Davis, Portland, secretary; Elmer E. Daicey, Auburn, treasurer. F. E. Burkett, of Union, W. H. Park, of Portland, F. L. Ames, of Norridgewock, W. R. Dresser, of Newton, and W. H.

Luroy, of West Paris, were appointed members of the executive committee.

THE CITIZENS' TELEPHONE COMPANY, Grand Rapids, Mich., has recently closed a record-breaking fiscal year. There was an increase of 3,902 telephones, of which 1,190 were in the city of Grand Rapids. The total earnings were \$498,687.67. Dividend payments amounted to \$168,902.33 and \$30,000 was carried to surplus. Entire number of telephones in the system has increased from 19,742 to 23,644. Toll line earnings show an increase from \$27.95 to \$30.57 per mile.

CAPITALISTS OF HOUSTON, TEX., have incorporated the Southern Telegraph and Telephone Company, with an authorized capital of \$100,000. The line will be long-distance throughout southern Texas, with local exchanges in all the towns through which it will run. Nineteen counties will be covered and at San Antonio connection will be had with the Citizens' telephone lines. George W. Burkitt, Louis J. Barnes, A. S. Fisher, J. M. Reagan and Edward Kennedy constitute the first board of directors.

THE STOCK EXCHANGES of Toledo, Cleveland and several other places will list the voting trust certificates in Cuyahoga Telephone common and preferred. It will be recalled that immediately after the Brailey syndicate took possession of the Cleveland Independent Telephone companies it was agreed to pool the stocks for a period of years and at the same time to increase the dividends. The stock thus pooled will be represented by voting trust certificates, and it is these certificates that will be listed on the exchanges. The stocks will not be withdrawn from the board for the time being, since a certain percentage has not been pooled. The market in future will be trading in both of these issues.

### Extending Train Telephony.

For the purpose of widening the sphere of usefulness of the telephone extensive experiments are being made on the Harriman railroad lines. It is proposed, if practicable, to equip trains with a telephone device enabling the conductor and engineer to consult while the train is in motion. A complete telephone system is also soon to be established in connection with the extensive block signal system now installed and is to be used to bring dispatchers and tower operators into closer touch. It will also serve to connect the dispatcher with the non-telegraphic stations. On some sections of the roads it is intended to introduce the composite system of wires, by means of which one wire may be used simultaneously for both telephone and telegraph work. Trains will be equipped with portable, composite telephone apparatus, enabling the conductors to reach the dispatcher or the nearest telegraph station immediately.

### The Situation at Rock Island.

The Independent press of Rock Island, Illinois, led by the *Daily News*, is making strenuous efforts to point out to the retail merchants the absolute necessity of active telephone competition. The Bell company has not given a service entitled to the support of the business men; but, according to the *News*, has used money to placate some of the local newspapers. The *News* says that it is fighting "for the principle that the people are greater than the Bell monopoly and for the clear economy that says Rock Island has rights which the Central Union must respect." It's a hard fight, sure enough, but with truth and justice on its side the *News* will win out in the long run.

The new plant of the Baird Manufacturing Co. is now in full operation and turning out measured service, secret-service and general telephone apparatus in large quantities.



# A Good Sample of Empire State Independence

By H. R. ROBERTSON

For several years the middle western states have led the Independent telephone movement, but of late the more eastern states, especially New York, have taken a remarkable impetus. This is apparent over the entire state, but particularly so in Dansville, the county seat of Livingston county.

Following is a brief history of how the Livingston County Telephone Company was started on its career:

After one of the hardest battles between corporate interests and individual rights that this village or, indeed, many large cities had ever seen, and which extended over a period of months, a franchise was finally granted, on April 12, 1905, to the Livingston County Telephone Company, by the board of trustees of the village of Dansville, N. Y., but only on condition that they would have an exchange in operation within sixty days, taking care of at least one hundred live subscribers. With the energy that ever characterizes Americans, born of the Independent stamp, our friends in Dansville and vicinity got to work and the one hundred telephones



JAMES M. BROGAN,  
Manager Livingston County Telephone Company,  
Dansville, N. Y.

were soon connected in working order, but only on a temporary twelve drop magneto board, of which three of the twelve drops were used for toll purposes.

It was demonstrated in a very short time that this new company was in the field to stay and then came the telling work of making itself secure by arranging so as to give nothing but the most perfect service to its patrons. It was now that the basis had to be strongly and surely laid as a foundation for future prosperity.

At first an old wooden building, previously used as a wagon shop, was all sufficient for the purposes of construction headquarters, storeroom, work shop and ex-

change combined. It was here, in a miniature room partitioned off in a corner of this old wagon shop that the Livingston County Telephone Company had its birth. It was soon apparent to the management, however, that quick steps must be taken to meet the ever increasing demands for Independent service and so the work of installing a new switchboard, laying underground and hanging aerial cables, and the setting of poles in the village streets was considered.

The poles on the highways leading to the surrounding farms had been erected very soon after the granting of the franchise, as 91 of the 100 subscribers required were found in the outlying districts, the remaining 9 being located in Dansville proper.

When the important question of equipment came up, it was most carefully discussed and gone over with the one idea in mind, of obtaining the very best money could secure. That the decision reached was a wise one is demonstrated by the unexcelled service of the Livingston County Telephone Company has been able to give to its subscribers at all times. In fact, the great success of the Livingston County Telephone Company is due in no small measure to the equipment they installed.

The exchange, at the present time, is located in a fine building, which was formerly a business block, but was entirely remodeled to especially conform to the needs of a modern common battery telephone system. It takes up half of the second floor of this large building, which is known as the "Telephone building," owing to the telephone interests centering at that point.

The offices of the company are fitted up elegantly, being finished in natural oak. The floors and woodwork throughout match the beautiful new multiple switchboard, which was installed December 30, 1905, on which date the lines were cut over from the old place of business to the new and sumptuous quarters. This time was made an occasion of note. The day was given over to inspection and festivities. The board of directors had issued invitations to the village and town boards of Dansville, and to many prominent men of Livingston county, as well as to the officials of the Inter-Ocean Telephone & Telegraph Company of Buffalo. During the afternoon an elaborate dinner was served to the invited guests at the Hyland House, Dansville's finest hotel.

Through its connection with the Inter-Ocean Telephone & Telegraph Company the Livingston County Telephone Company is able to reach over 75,000 people resident in the western section of New York and adjacent territory—an item of no mean importance and one which the company appreciates to the fullest extent.

The growth of this exchange from the time of its installation at the new center has been all that could be desired. The 400 mark was reached May 15, 1906; just a small fraction of a year since it started to do business; and the fifth hundred has already been started and is well under way. Not so bad for a place of 3,600 population.

Besides the exchange of Dansville the Livingston County Telephone Company operates others located at Geneseo, Mt. Morris, Avon, Honeoye Falls, Livonia, Lima, Moscow and Caledonia, N. Y., and we are happy to state that all are in a prosperous condition and daily increasing their subscribers' lists.



## The R-L Cords

The above is more than a trade mark. It stands for better service and lower cost of maintenance.

It has been our aim to make switchboard cords that would wear longer than any other. We use the best raw material it is possible to obtain, and spare no pains in workmanship.

As evidence that they do wear longer, many of the leading independent operating companies and manufacturers are using them exclusively.

Suppose you write for a list of companies using them and our prices, or send us a trial order—that's the best test. We guarantee satisfaction.

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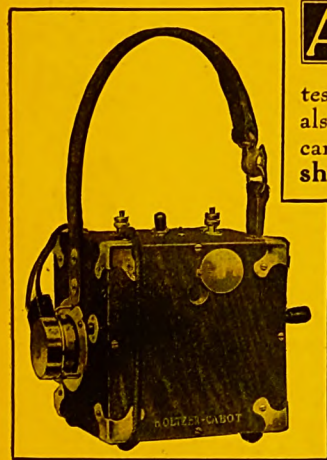
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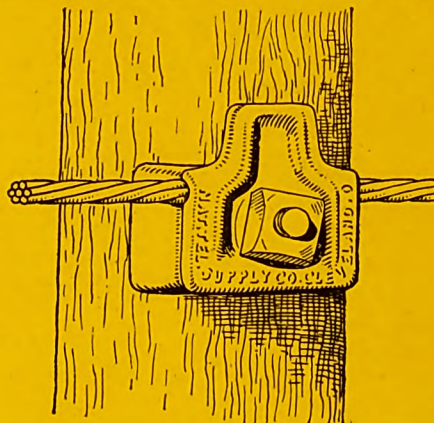
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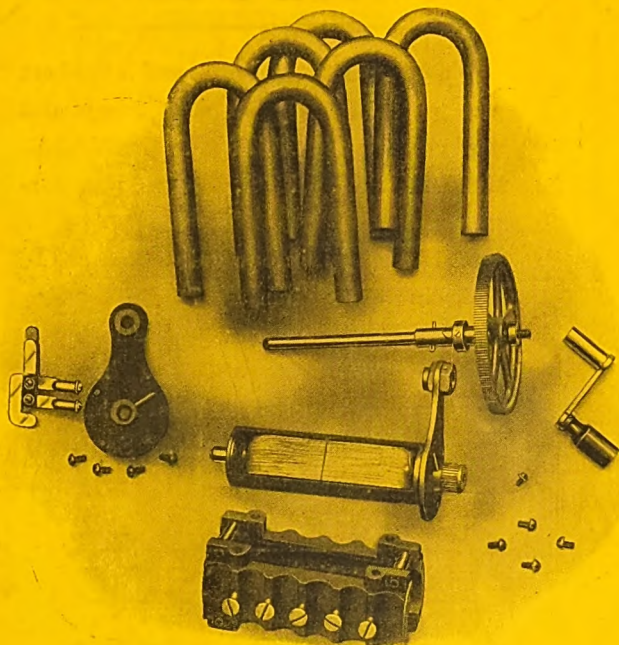
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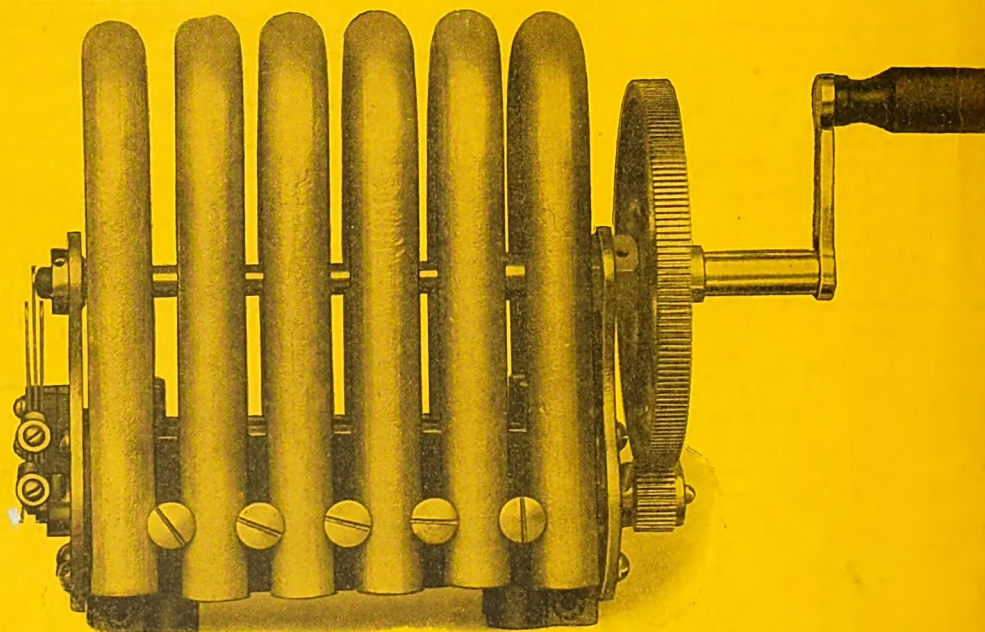
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VOL. XII  
No. 6

INTERNATIONAL  
TELEPHONE JOURNAL

NOVEMBER  
1906

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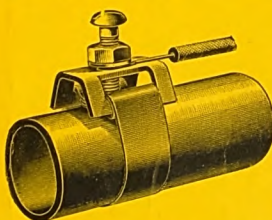
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# SOUND WAVES

A Monthly Magazine Devoted to the Interests of Independent Telephony

Vol. XII.

NOVEMBER, 1906

No. 6

## SOUND WAVES

PUBLISHED MONTHLY AT LOGANSFORT, IND., U. S. A. PRICE ONE DOLLAR A YEAR  
COPYRIGHT, 1906.

Entered as second-class matter July 14, 1903, at the Post Office at Logansport, Indiana, under Act of Congress of March 3, 1879.

The Thos. H. Wilson Co., Logansport, Indiana, Proprietors and Publishers

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New Advertisements can be inserted if received by the 5th of each month but to insure proper classification they should be in this office by the 1st.

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Subscriptions, Etc.—Address the Logansport Office. In sending personal checks for books or subscriptions, include 15 cents for exchange.

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## EDITORIAL COMMENT

### THE CHICAGO SITUATION.

The eyes of the telephone world are on Chicago and New York at the present moment. In both of these cities the Independents are trying to secure a much needed foothold.

The New York situation is largely in the hands of the courts. If the Consolidated Telephone Company of Buffalo succeeds in obtaining a favorable adjudication of the rights of the New York Electric Lines Company, which has a franchise to construct conduits and lay cables for telephone, telegraph and electric light purposes in New York City, or if the Atlantic Telephone Company can convince the Board of Estimate and Apportionment of the City of New York that it should be granted a franchise, the Independents are sure of connection with the metropolis.

In Chicago conditions are more complicated. The city is monopolized by the Chicago Telephone Company, a Bell concern, which has, in the past, succeeded in throttling serious competition.

Its sole competitor is the Illinois Tunnel Company which, under its charter, is compelled to maintain a telephone line. Up to the present time the Tunnel Company, which uses the automatic equipment, has done very little to develop the telephone branch of its business.

Recently, however, Mr. Joseph Harris, who is vice president of the Automatic Electric Company, has purchased the plant of the South Bend (Ind.) Home Telephone Company and made plans for the organization of a \$5,000,000 toll line company for the purpose of taking over the telephone business of the Illinois Tunnel Company and the construction of toll lines out of Chicago to connect with all Independent companies.

South Bend is to be the switching point for long-distance business to and from the east, Michigan and Indiana, and automatic exchanges are to be installed in a number of prosperous towns in Indiana and elsewhere.

The Inter-State Telephone and Telegraph Co., the largest Independent organization in Northern and Central Illinois, has its wires strung to the very gates of Chicago, and in order to secure connection with the city without costly and almost hopeless delay must take advantage of the Illinois Tunnel Company's franchise.

The Illinois Manufacturers' Association, an organization composed of prominent business men, recently submitted to the city council of Chicago an ordinance, the salient points of which are printed elsewhere.

The men back of the ordinance are able to carry out every promise they make, but the obstacles in their way are momentous and seemingly insurmountable.

Mayor Dunne is of the opinion that the telephone service of a city is essentially a monopoly and believes that until the city can operate its own telephone system the service should be performed by one company. Personally, the mayor is opposed to the dual system, in spite of its many advantages.

He is not opposed, however, to the Illinois Manufacturers' Association and believes that, whatever may eventually become of the latter's ordinance, it will compel the Chicago Telephone Company to improve its equipment and lower its rates.

The real enemies of Independent effort are the "gray wolves" who have made the Chicago city council notorious.

Every fair-minded citizen knows that the Bell company is not entitled to a renewal of its franchise. For years it has violated its agreements with the city which, if they were carried out at all, had to be enforced by judicial decisions, after expensive litigation.

The franchise monopoly enjoyed by the Chicago company has enriched every man connected with it. Annual dividends varying from 8 to 35 per cent. have been declared, to say nothing of fat stock dividends.

It is not likely that the beneficiaries of the existing monopoly franchise will surrender the plum they have enjoyed for so many years without a titanic struggle.

If necessary, they will spend a million dollars to perpetuate their reign, and with such an amount considerable fine work can be done in a metropolitan city where a large percentage of the aldermen is in politics "for revenue only."

The importance of connection with the Independent companies outside of the city is not appreciated by the people of Chicago; nor will it be until some strong organization undertakes the task of education.

Chicagoans, in fact, know very little about Independent telephony. They have been trained according to Bell rules, and not one in ten knows that there are telephones and telephone companies not owned or controlled by the Bell Company.

The day of general deliverance is coming, of course; but even the most optimistic friend of the Manufacturers' ordinance cannot consider it very near.

Taking all the facts here given into due consideration, it must be admitted that the only immediate relief in sight is the rapid development of the Illinois Tunnel Company's telephone system, the operations of which are at present confined to the "loop district," the business part of the city.

President Wheeler, of the Tunnel Company, stated some time ago that no Independent telephone company would be discriminated against and that all could enter Chicago on an equitable footing.

Mr. Wheeler's statement has been accepted in good faith and hope is running high in every locality where connection with Chicago has become a necessity.

The claim has been made that the Illinois Tunnel Company is controlled by the Chicago Telephone Company. This is merely a claim, however, and one that is not easily proved.

Until it is substantiated by something more than gossip the Independent operators need not worry about it. The Bell Company undoubtedly has picked up some of the tunnel stock, but probably not enough to dominate the situation.

Mr. Harris, who is interested in the telephone end of the Tunnel Company's business, has been closely identified with the Independent movement and there is not the slightest indication that he is wavering in his allegiance to the good cause.

SOUND WAVES knows of no reason why the tunnel plan for long-distance connection should not be carried to a successful conclusion; but believes that the time has come when the large body of western Independent operators and the public at large should be informed in detail of the purposes of the Tunnel Company.

If Mr. Harris is animated by the high motives for which SOUND WAVES is giving him credit, he will prove himself a public benefactor. And, as such, publicity, and the confidence of the people resulting therefrom, should be courted rather than shunned.

### KELLOGG REPUDIATED EVERYWHERE.

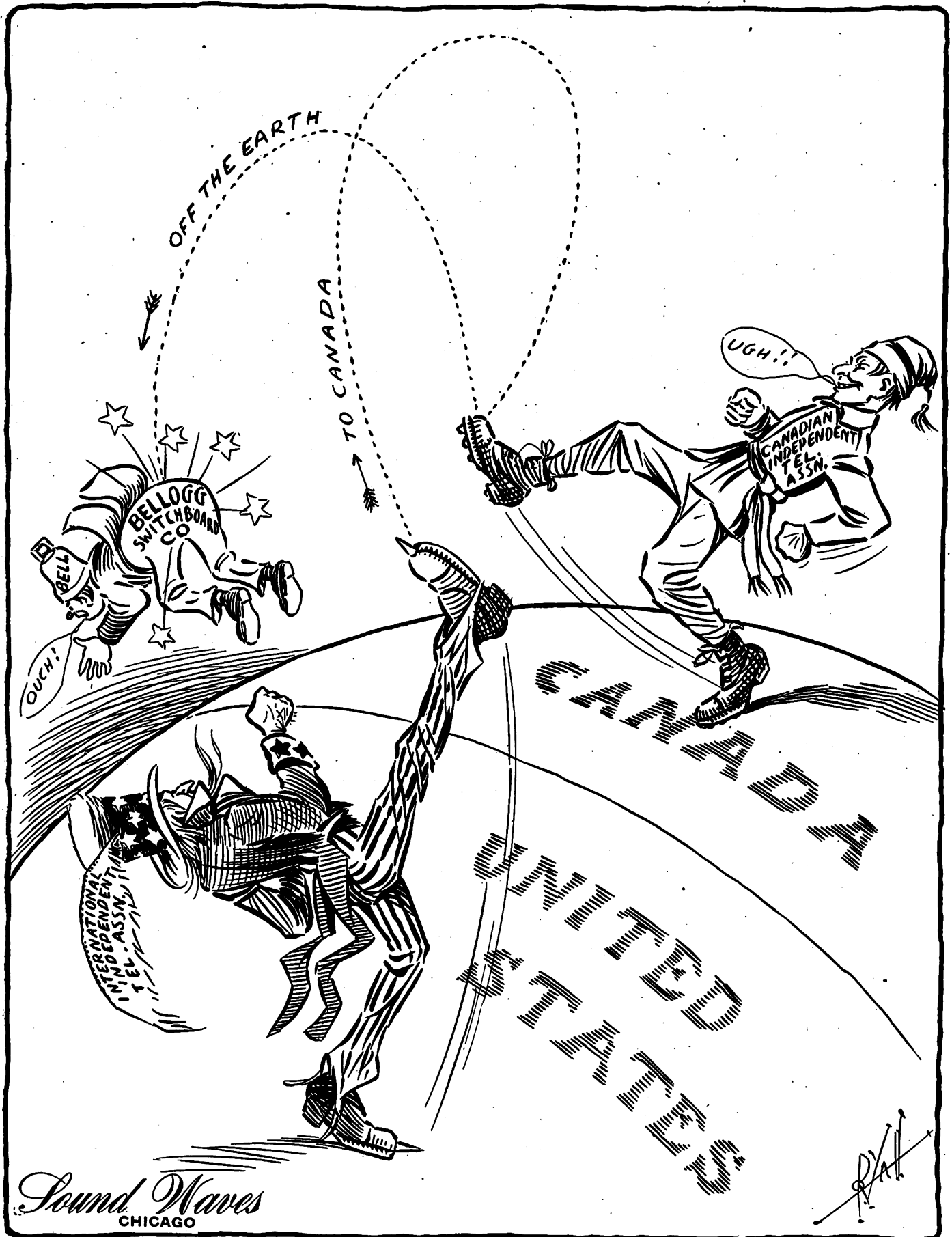
An esteemed correspondent asks SOUND WAVES why the Independent telephone men are waging such a fierce war on the Bell-Kellogg combination and why other "trust-owned" manufacturing concerns are allowed to conduct their business without let or hindrance.

It is because the Kellogg concern travels under false colors. Although its stock is, admittedly, controlled by the Bell Company it masquerades as the "largest Independent telephone factory in the world," not only in its circulars, but in the advertising columns of some "Independent" telephone journals.

There are other manufacturing houses which are controlled by the Bell, but their ownership has never been denied. The bulk of the apparatus manufactured by them is sold to the Bell Company, and everybody knows it.

They are not ashamed of their connection with the monopoly. A few rather take pride in it, and that is why the Independent telephone press and the International Association leave them alone.

the Bell with equanimity and do not like their pro-  
They are open enemies, not pretenders. They wear



Sound Waves  
CHICAGO

SHORT CIRCUITED.



the Bell with equanimity and do not hide their proprietorship under the Shield of Independence.

The Canadian Independent Telephone Association, at its recent annual meeting, passed a resolution prohibiting the purchase of new apparatus from the Kellogg combination. Operators whose exchanges are now equipped with Kellogg boards and instruments are permitted to make such additions as the exigencies of the situation may require, but as far as new equipment is concerned the firm is tabooed.

In other words, if the Independents are true to their cause, the fate of the Kellogg, as an alleged "Independent factory," is sealed, and hereafter it will have to place its stuff where it belongs—in Bell exchanges.

Another point made by the same esteemed correspondent is worth considering.

He makes the claim that there are other so-called Independent factories whose stock is controlled by Bell interests.

SOUND WAVES has no positive knowledge to this effect. Ever so often the statement is made that the majority of stock of such and such a company has passed into the hands of the Bell.

Such reports may be true or they may be lies. It is exceedingly difficult to determine who owns a large company whose stock has been on the market for a number of years. Sometimes not even its officers know with any degree of assurance in whom the real control rests.

It is certain, however, that no manufacturing company controlled by the Bell Company would receive Independent patronage, after the fact of such control had been established to the satisfaction of Independent operators.

SOUND WAVES does not believe that, at the present time, any Independent factory of note is being manipulated by Bell interests and it would therefore advise its esteemed correspondent to think twice before mentioning names in public.

For irrational gossip in such connection might do great harm and injure the Independent cause which, all must admit, is upheld vigorously by the Independent manufacturers.

On the other hand, in the case of the Bell-Kellogg, wide publicity is needed and Independents cannot be too emphatic in their denunciation of the concern, whose ownership by the Bell Company was established in court in course of the litigation between Mr. Kellogg and the firm which he founded and possession of which he lost through peculiar and spectacular methods.

The Canadian Independents showed wisdom in adopting the anti-Kellogg resolution passed by the International Association last June.

It means that hereafter no Independent operator on the continent of North America, from Labrador to the Gulf of Mexico and from ocean to ocean, has any excuse for contributing money to the Bell treasury, every dollar

of which would be used to fight him and the interests he represents.

That in this struggle of principle against deceit and hypocrisy the right will win is no longer a question, but in order to make the victory more complete it is necessary for the Independent forces to stand together until the Kellogg crowd, as at present constituted, will be forced to confess in public, as it was in court, its allegiance to the Bell monopoly.

### OUR NEW TECHNICAL EDITOR.

Owing to business reasons Mr. W. A. Taylor, who has been the technical editor of SOUND WAVES for some time, has severed his connection with the magazine; a step that is as greatly regretted by the publishers as it will be by the readers.

Mr. Taylor has done splendid work and it is the hope of all who are familiar with his thoughtful and progressive researches that he will continue to give to the telephone world the benefit of his ripe knowledge in the form of contributions to SOUND WAVES.

Mr. Taylor will be succeeded by Mr. H. P. Clausen, an engineer of the highest standing and a writer of recognized ability.

Mr. Clausen is a telephone man by inclination and choice. Born at Omaha, Neb., in 1870, he became engaged in electrical supply and construction work as early as 1890. Three years later he turned to Independent telephone work, and from 1894 to 1899 was chief engineer of the Western Telephone Construction Company. Since 1899 he has been chief engineer of the American Electric Telephone Company. Prior to 1890 he spent four years in the study of the different wood-working trades, with the intention of adopting architecture as a profession, but, as stated, dropped that field in 1890 in favor of electrical work.

Mr. Clausen enjoys the unique distinction of never having been in the employ of a Bell Company, or any of its sub-licensee companies.

The publishers feel assured that under Mr. Clausen's direction SOUND WAVES will continue to be the most up-to-date and progressive technical telephone journal published.

The new technical editor has suggested many improvements in the technical section of the magazine, some of which will be inaugurated in the December issue.

### THE PEOPLE WILL DECIDE.

The people of Manitoba will decide next December whether they want a provincial and municipal system of telephones or not.

The government of the province is in favor of the establishment of provincial long-distance lines and municipi-

pal local exchanges, the government to guarantee bonds issued for the construction of the latter.

Manitoba is a country of magnificent distances, rich in agricultural resources and mineral wealth. The latter has not yet been developed, principally on account of lack of communicating facilities; but the farm lands are being taken up rapidly by progressive settlers from Eastern Canada and the United States.

The Bell Company hitherto has controlled the telephone situation. Its rule has been oppressive, its prices exorbitant and its service miserable.

Since the government announced its intention of building a provincial system the monopoly has expended a vast amount in improving and extending its system. Lines have been built from Nowhere into the wilderness and all the construction material in the province has been brought up. Rates have been reduced wherever the agents of the company could induce farmers to sign long-time contracts.

The vote on the telephone question in Manitoba will interest the whole world. It will be the first time in the history of telephony that a broad government and municipal ownership proposition has been submitted to a plebiscite.

It will be of double interest because Manitoba is an ideal country in which to test the efficiency of government ownership. Its population is far beyond the average in intelligence, absolutely free of communistic tendencies, and will decide the telephone question upon a business basis.

All over Canada the public ownership idea as to long-distance lines is popular, and should the Manitoba experiment prove a success the government at Ottawa will be compelled to follow the example of the western province and take steps to take over or construct the long-distance lines of the Dominion.

### JUST A WORD OF WARNING.

The common practice is to denounce the Bell Company as the greatest hindrance to Independent telephone development.

In a great measure this is true enough, but have not many Independent companies given unwilling, but yet effective, aid to the enemy?

There is no use in disputing this statement. The aid, it is true, was given unintentionally. Yet whenever and wherever an Independent operator constructed and installed a poorly-equipped exchange he put a powerful weapon into the hands of his Bell opponents.

A paying telephone investment depends on proper construction, equipment and management; but the best management on earth cannot have a fighting chance unless it has plenty of good ammunition back of it.

There is not the shadow of a doubt that Independent telephone securities, of local nature, would be of far

greater value today if ordinary business methods had been employed in the construction of certain systems that have failed to meet the expectations of the people with whose money they were built.

It is not because sufficient capital was not invested, but because it was not properly expended.

The inevitable results are that the cost of maintenance is excessive, the service far from what it should be, and stockholders are dissatisfied.

Every good telephone man interested in the Independent movement regrets that poor work and material were ever employed where they could do so much harm to a splendid cause.

Papers like SOUND WAVES have done all in their power to lessen the evil and competent engineers have written at length on the subject; still poor construction is permitted to go on in many places.

Construction is the foundation of a telephone system. Good construction is cheaper than poor, and the difference in the result between the two is beyond comparison.

In no circumstances should incompetent men be employed to build systems, nor any but the best material and apparatus used.

As soon as such practice becomes universal, telephone securities will show the result and it will no longer be necessary to worry about the Bell Company. It will do the worrying.

### MR. MAC VICAR RECANTS.

The threatened "expose" of the methods of Independent telephone operators before the Chicago convention of the League of American Municipalities did not materialize.

Several weeks preceding the date of the meeting the daily press announced that Mr. Mac Vicar, secretary of the League and editor of the League Bulletin, would surprise the nation by telling how Independent telephone companies are financed.

The International Independent Telephone Association took the matter in hand, and when the convention met was represented by Charles West, president of the Pennsylvania Association; C. B. Cheadle, secretary of the Illinois Association; J. B. Ware, secretary of the Michigan Association, and J. A. Harney, assistant secretary of the International Association, who were anxious and willing to inform the delegates of the importance of the Independent telephone movement.

It was, however, found "inadvisable" to bring the question before the convention; and Mr. Mac Vicar courteously informed the four gentlemen named that hereafter the columns of his Bulletin would be open to the Independent telephone people for any corrections they might care to offer to articles previously published.

The International Association will arrange to sup-

ply the Bulletin with matter presenting the Independent cause in its true light and especially invites companies which have been attacked in the Bell articles published in the League Bulletin to make themselves heard.

Together with all other advocates of Independent telephony, SOUND WAVES rejoices at Mr. Mac Vicar's change of heart and trusts that his sudden conversion, like that of Saul of Tarsus, will be permanent and that he will develop into a mighty defender of the good cause.

In order that his new faith may be strengthened, he is most heartily invited to read Mr. Cheadle's splendid article "Is Competition Desirable," which appears elsewhere in this issue. It will supply texts for a number of editorials and altogether is an argument that should be thoughtfully considered by every mayor and alderman and editor in the United States.

### JUST BETWEEN OURSELVES.

The many words of unsolicited commendation which have been received by SOUND WAVES during the past two months, from readers as well as advertisers, are accepted with genuine gratitude.

SOUND WAVES is neither the "biggest" nor the "bulkiest" telephone journal in the world. It is not sold by the pound, nor padded, nor inflated. It aims to print articles of interest to telephone operators, employees and engineers.

It proposes not to print a single article or item the correctness of which has not been verified. Such a policy entails a vast amount of labor, but it will be pursued indefatigably and include even so varied a department as "Personal and Field Notes."

In its editorial policy SOUND WAVES will continue to be radically independent, neither countenancing nor excusing any affiliation between Independent and Bell interests, whether in the operating or manufacturing field.

Particular attention will be paid to the advertising pages, and no advertisement will be accepted from Bell-tainted concerns or houses that are not absolutely reliable.

SOUND WAVES desires to occupy a position in the telephone advertising field such as is enjoyed by the Ladies' Home Journal and the Youth's Companion in the general field. Its pages will be closed to firms that fail to redeem the promises contained in their announcements.

Its technical department, always valuable, will be strengthened by contributions from the foremost telephone engineers—men who know how to let their light shine.

From cover to cover SOUND WAVES will be newsy, reliable, dependable and enterprising—a monthly epitome of everything that is worth knowing in the telephone world; so exact that its readers need look nowhere else for confirmation of anything that appears upon its pages.

There is no reason why a trade and technical paper should not be as high in tone and irreproachable in edi-

torial management as other first-class publications; and there is no doubt that the policy of SOUND WAVES, as here outlined, will be appreciated by the Independent telephone men of the United States and Canada.

The editors solicit the co-operation of the telephone public in their efforts to make SOUND WAVES the unquestioned authority in its chosen field.

New ideas will be treated with respectful consideration, because the man who "gets out of the rut" usually is a thinker whose arguments are worth hearing.

SOUND WAVES does not believe in doing a thing just because some other journal is doing it. While it has unbounded admiration for its highly esteemed contemporaries it proposes to carry out its own plans in its own way—the best way.

There is but one place for SOUND WAVES—at the top of the ladder.

### Franchise Fight in Chicago.

The city council of Chicago now has under consideration the telephone ordinance drawn up by the Illinois Manufacturers' Association. The present franchise of the Chicago Telephone Company expires January 1, 1909, and whatever may be the outcome of the coming struggle for supremacy between the Manufacturers' company and the Bell the terms of the former's offer to the city will form the basis of future negotiations. Briefly states these terms are as follows:

Franchise for thirty years, with option of purchase by the city at the end of twenty years.

Mayor and commissioner of public works to be ex-officio members of the board of directors.

Books of company open at all times to inspection of city controller.

All wire underground in district bounded by Belmont avenue, Western avenue as far south as Twenty-second, thence east on Twenty-second to Halsted, south on Halsted to Fifty-fifth street, and east to Lake Michigan.

Illinois Tunnel conduits to be used when necessary.

Manufacturers' association promises to have 25,000 'phones in service before Jan. 1, 1909—the date of expiration of present franchise—and 50,000 'phones by Jan. 1, 1910, on penalty of forfeiture of \$50,000.

Free service to city, except the police department, which pays an annual rent of \$1.50 a year for each combined receiver and transmitter.

One-fourth of net profits go to city as compensation.

If the city decides to purchase at the end of twenty years it will pay in cash the cost of duplicating the property, plus 5 per cent. additional as compensation for the compulsory sale, but shall not pay anything for earning power or franchise value.

A penal sum of \$100,000 to be put up by the company to cover failure to carry out any provision of the ordinance.

Rates per year are to be as follows:

	Total out-going calls.
Business, direct line, unlimited service.....	\$90 .....
Business, 2 party line, unlimited service.....	60 .....
Business, direct line, measured service .....	50 1,000
Business, 2 party line, measured service .....	35 700
Business, 4 party line, measured service .....	25 500
Extension sets on business lines, unlimited, each.....	12 .....
Extension sets on business lines, measured service, each .....	5 .....
Residence, direct line, unlimited service.....	60 .....
Residence, 2 party line, unlimited service.....	45 .....
Residence, 4 party line, unlimited service.....	30 .....
Residence, direct line, measured service.....	30 600
Residence, 2 party line, measured service.....	20 400
Residence, 4 party line, measured service.....	15 300
Extension sets on unlimited residence lines, each.....	10 .....
Extension sets on measured residence lines, each.....	5 .....

# Underground Cable Construction

By G. J. NEWTON

Unless the conduits are wired when they are laid (which is seldom done) it is necessary that the ducts be rodded from manhole to manhole and a wire pulled in to serve as a means of passing the heavy rope through for pulling the cable. Fig. 1 shows the position of the reel at one manhole and the capstan at the other. Fig. 2 shows a "cable jack" which can be used in place of the capstan; by means of the holes in the sides of the jack the wheels can be set at the proper height both at the manhole and above ground and the hauling line lead under the bottom wheel and over the top one. The

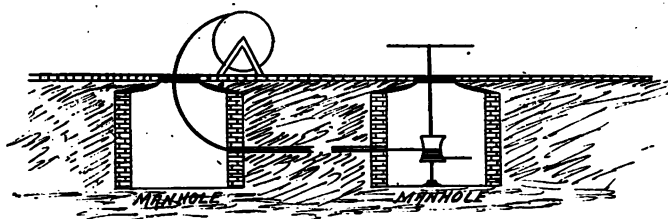


Fig. 1.

power can be furnished by a team or as one company did, viz., a gasoline engine and windlass mounted on a wagon.

A team should not be hitched direct to the hauling line under any circumstances, but if used, a set of blocks should be attached to the hauling line.

The capstan is slower, but the strain is kept uniform and there is less liability to damage the cable in case there is trouble in feeding in.

For long pulls, where the strain is heavy, a wire rope will give better satisfaction, as it does not stretch and maintains a more even strain on the cable.

There are several methods of fastening the rope to the cable. In small cables the end is frequently passed through the eye of the rope and turned back on itself and served with wire or machine. This method cannot be used on large cables and the common practice has been to use several strands of No. 12 iron or No. 14 steel wire passed through the eye of the rope and then served back over the cable in opposite directions, thus making each turn bind the one beneath it.

On account of the larger size of cable that has recently come in use there is not sufficient room between

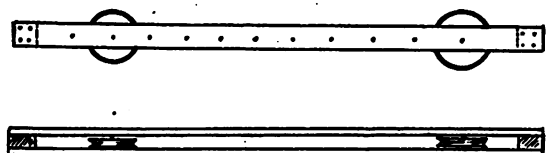


Fig. 2.

the cable and the conduit to permit of a sufficient number of wires being used to carry the strain and a woven wire sleeve, Fig. 3, has lately been used extensively. These sleeves can be had in sizes to fit any cable and are not only quickly attached, but distribute the strain equally and are exceedingly handy.

Before cable is pulled in a duct, a mandrill, or wire brush, followed with a bunch of rags, should be pulled

through to clean the duct out thoroughly, as frequently dirt, stones and even tools are left in the duct and the risk of damage to the cable is great.

Large sizes of cable for underground should be ordered in the exact lengths to fit each section, sufficient being provided to bend around the manhole and leave enough for a splice.

If possible, it is best to start the cable from the central office so that the splicers can cut in the office end first and work from there out, as this greatly facilitates testing and picking out pairs for the various taps.

In pulling in long sections of heavy cable the strain will be greatly lessened by a liberal use of soapstone or grease; the soapstone is better as the grease is very apt to cause an offensive smell after lying in the ducts for some time and certainly leaves a cable in filthy condition if it has to be pulled out and handled later.

In selecting the ducts for the various cables it is well to put the longest cables on the bottom and leading around the manholes on the side. That will make the neatest job when the lead of the various taps are considered. A little study given to this matter will be amply repaid in the appearance of the completed work in the manholes.

In pulling pole ends it is better to lead the cable in from the manhole and pull from the top of the pole, leading the hauling rope through a snatch block at the foot of the pole.

The cable should not be left exposed on the distributing poles from the point where it comes out of the iron pipe to the cable box, but should be protected in some manner. Fig. 4a and 4b shows two sections of mould-

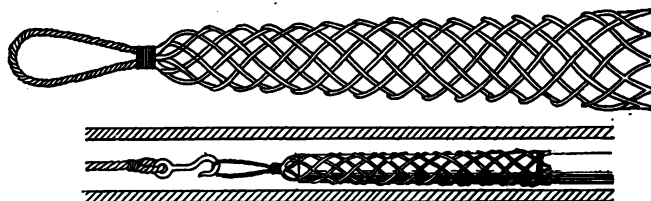


Fig. 3.

ing that can be used for this purpose and will make a neat job and give ample protection at a reasonable price.

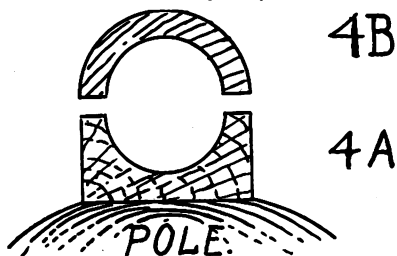
The flat moulding, Fig. 4a, is fastened to the pole permanently with nails or screws, the cable laid in place and the top (Fig. 4b) placed over it and held in position with galvanized pipe straps. The moulding should be thoroughly painted before being placed on the pole.

Manholes should have cable hangers on the sides for supporting the cable. One method of arranging these hangers is to fasten two pieces of 2x3 wood upright in the manhole and use ordinary "pipe hangers" screwed to the wood; another and better arrangement is an iron support, about the size of a crossbeam brace, having holes in which the iron hangers can be hooked; if wood is used it should be painted and where the iron hanger is used it should be galvanized or thoroughly painted with asphaltum paint.

All cables in the manhole should be banded together and a copper ribbon 1/2-inch wide by 1-16-inch thick will make a good band for this purpose.



Where "pot heads" are used for terminating the cable conductors, it is a good plan to have the potheads made in the storeroom where they can be properly filled up with compound, as potheads made on the pole are frequently not secure owing to the compound not having sufficient time to settle. Rainy days can be well employed



in making potheads, which can be spliced on the cables as needed. While this makes an extra splice the cost will not be more, as a splice is easier made than a pot-head and you can have the assurance that the pothead will not cause trouble later.

All cable conductors should be soldered to the cable clips, lugs or arrestors where they terminate, as it is seldom necessary to change them and such changes should be done by a man properly equipped with tools to do the work.

Cable construction, when properly laid out and built, will insure good service with very little trouble and will certainly prove a paying investment for the company if properly done; cable is expensive and experienced men should be employed in handling it as the result will justify the extra cost.

### PAY STATION SIGNALS.

BY EDWARD P. BAIRD.

The most vital element in a telephone pay-station is the signals and yet it is an undisputable fact that signals such as have heretofore been used in all makes of telephone coin collectors are confusing, uncertain and easy to beat, for the following reasons:

1. A musical ear is essential in an operator to distinguish between the tone of a high or low keyed cup bell.
2. Operators must distinguish between the different musical tones of cup bells, cathedral gongs and mechanical buzzers.
3. In automatic action machines, where the gravity of a falling coin gives the striking power, it is self-evident that the force of the blow given by a silver dollar is ten times greater than with a dime. This compels the operator to discriminate between the strength of the tone as each coin is deposited.
4. Cup bells are easy to procure and by laying one anywhere on the telephone can be struck with a pencil and signal imitated.
5. Striking the telephone ringer bells with a pencil gives an excellent signal.
6. It is a fallacy to use cup bell signals, not only for the above reasons but because they are absolutely the poorest signal ever used. The tones in a cup bell are in its periphery and therefore but a small vibration occurs at its center to be transmitted over the line. The truth of this statement can be proved on a telephone line by rapidly striking a cup bell five times; the result at the receiving telephone will be five thumps and then a bell tone. No bell tone can be heard while the rapid blows are being struck. Another experiment is to drop several

nickels rapidly in the 5c slot of an "automatic" pay-station and at the receiving telephone it will be impossible to tell how many coins were deposited.

7. In mechanically operated machines the noise of the mechanism during the signal period has been very confusing, while in "automatic" pay-stations the rattling of the coins down the channel during the signal period serves to confuse the operator.

After finding so many and such serious faults with existing signal codes the problem was to secure not only a loud and clear vibrating signal but one which was unbeatable. A long series of experiments with many signals developed the fact that not only had the cathedral gong the best transmission qualities, but that when struck rapidly every blow stood out unmistakably. A cathedral gong is not easily procured and must be rigidly mounted and struck exactly right to get the tone.

With this clear and unmistakable signal tone as a base the "Common Sense" signal code was developed; one stroke for a nickle, two for a dime, three for a quarter, four for a half dollar and five for a dollar.

To prevent beating, the signals are struck rapidly and it is therefore not possible to get a quarter signal by depositing a nickle and then a dime as there is a decided pause between each deposit and also mechanical noises as the coin is deposited and lever pulled. To prevent confusion the coin carrier operates on the return stroke, thus avoiding all noise during the signal period.

One serious fault with the cathedral gong signal tone was in the fact that its tremendous vibrating qualities were easily affected by striking the case, so I designed a muffler which normally rests against the cathedral gong and is removed by the deposit of a coin only and returned to place immediately after the signal is struck.

That this signal code is "Common Sense" is self-evident as with but little instruction an operator becomes an expert. I am confident that this signal code will become the future standard, as the saving of the present loss through beating, uncertainty and errors, would in a comparatively short time pay for an up-to-date machine.

### Telephone Transmitter.

A novel telephone transmitter is attracting much attention at present among telephone engineers, says the New York Commercial. It is not a single transmitter with two diaphragms, but two distinct transmitters mounted facing each other at either end of a brass tube about  $1\frac{1}{4}$  inches in length.

The mouthpiece is mounted at one side of the tube and from this point sound vibrations are carried to the diaphragms within the tube, one of which is mounted at each end. The transmitter as a whole is supported by means of trunnions concentric with the two diaphragms, which allows it to be rotated throughout nearly a whole circle.

The current is conveyed to the electrodes by one of the trunnions, from which it passes to a corresponding transmitter, thence across to the other transmitter and out by means of the other trunnion. There is thus no breaking of the contact at the electrodes when the transmitter can be turned, and the diaphragm always remains vertical.

At the same time the rotation of the instrument effectively prevents any possibility of packing of the carbon particles. The instrument can be mounted on any type of standard, and as the transmitter can be turned over the apparatus can be used from either side without the necessity of picking up the stand and turning it around.

# A Plan to Win Back Lost Territory

A movement to establish Independent exchanges in at least a part of the towns in Missouri formerly controlled by the Buffum interests, but now, unfortunately, in the hands of the Bell Company, has been inaugurated by Vivian S. Smith, formerly manager for the Buffum Telephone Company at Bowling Green, Mo., and a telephone man of wide experience and the right kind of enterprise.

The plan pursued by Mr. Smith for the re-installment of Independent lines is simple, but far-reaching, and might be used profitably in other sections of the country.

The south and west parts of Pike county, wherein Bowling Green is situated, have something over 1,000 farmers' phones. They are called "White Oaks," and all past efforts of the Independents have failed to induce the farmers to believe in anything but "White Oak" or "Mutual."

Since the Buffum Company sold out to the Bell there has been quite a strong feeling among the country people as well as the town subscribers. Mr. Smith's plan is to unite all the farmer lines by appraising them and giving due credit on stock purchased by them in the new company. The Buffum people he advises to buy their lines from the Bell, if they can be bought right, and put them in the new deal at a fair valuation. He advocates starting with sufficient capital to build lines to every town in the county and to install a modern system at the county seat, Bowling Green, with about 600 phones, in addition to those on the the farm lines. He proposes to charge a regular rental for every phone on the system and to have no toll charges in Pike county.

The intention all the way through is to organize along proper business lines and to make the plans elastic enough to take care of future increase so that, should outside capital be needed, a very attractive proposition could be offered.

Mr. Smith has secured a franchise for Bowling Green and the Commercial club has endorsed the movement inaugurated by him. The printed letter which he sends to all the members of farm lines is a model in its way. On top of the sheet he prints the following: "Home Enterprise. Telephone Independence. Keep Your Money Here. Run Your Own Business." These crisp, convincing sentences arrest the attention of the recipient who at once becomes interested in the body of the communication which reads as follows:

"It is useless to ask you whether or not you are interested in the telephone business, because everybody now recognizes it as a necessity. Being a necessity it is of vital interest to us all that we should know we are receiving now and will always receive fair treatment. You are well aware of the fact that every man or large corporation can believe that any profit, however large, is legitimate if it goes into his or their own pocket.

"With this last fact in mind can you well believe that the consolidation of all concerns in any line of business is to the interest of the public?

"Can you be sure of fair treatment in any line of business where it has no competition, unless all persons supporting such a concern have an equal voice in selecting its directors?

"Last, but greatest of all, you know that what any

man or corporation has done in the past, and been forced to do otherwise through competition, they will do over again as soon as they have successfully done away with all possibility of competition.

"Farmers on all lines and in all sections of the country, can you afford to sit around and wait until the 'web' has so enclosed you that you are forced to do without a 'phone or else pay more than your income will justify for service to the town you do business in and your county seat, as well as your neighbors, or will you get together and organize a stock company along proper business lines, obtain better service, have a voice in the management and know that, whatever the profit, you will receive your proportion in the shape of dividends, thus keeping your money at home?

"Business men cannot afford not to help you because they depend upon you for their income. However, will say the business men will be glad to support such a move because they appreciate your trade; also their condition in this regard is the same as your own.

"Remember that a mutual organization furnishes service at actual cost to stockholders and being in control they are assured that no 'graft' exists. I have written this letter because of many requests from interested persons that something be done and I know this to be the only possible successful method, but it must be done thoroughly and at once. All lines over the entire county should be united on an equitable basis and those who do not control their own lines should build new ones or purchase the old ones, if they can be bought right. An exchange of modern type should be constructed in Bowling Green.

"I have plans whereby all this can be done, and without heavy expense on the part of the stockholders, each man investing an amount which may suit his pocket book. If, after reading the contents of this letter, you are not fully satisfied, would be pleased to see you and talk the matter over because I know I am right and know I can convince you with facts and figures.

"If you are convinced, come to see me anyway so that we can proceed far enough to call a BIG meeting to organize that ideal system which will unite all lines and FURNISH GOOD SERVICE at actual cost. Don't delay, sometimes it is fatal."

## The Hardest Metal Known.

Messrs. Siemens and Halske, of Berlin, have invented a new incandescent electric lamp. The filament is made of tantalite, a new metal possessing extraordinary hardness. Dr. Werner Von Bolton, in describing this metal before the Electro-Technical Association of Berlin, said sheets of tantalite were so hard that a diamond drill driven at the rate of 5,000 revolutions per minute for three days and nights continuously on the face of a sheet of the metal failed to penetrate it, a scarcely noticeable impression being made. The diamond drill itself was dulled. Messrs. S. & H. intend to manufacture tools and other articles of tantalite. Writing pens made of tantalite resist the action of chemicals to a very high degree; it is even more elastic than a gold pen and practically indestructible, and is likely to supersede both steel and gold pens when placed upon the market.

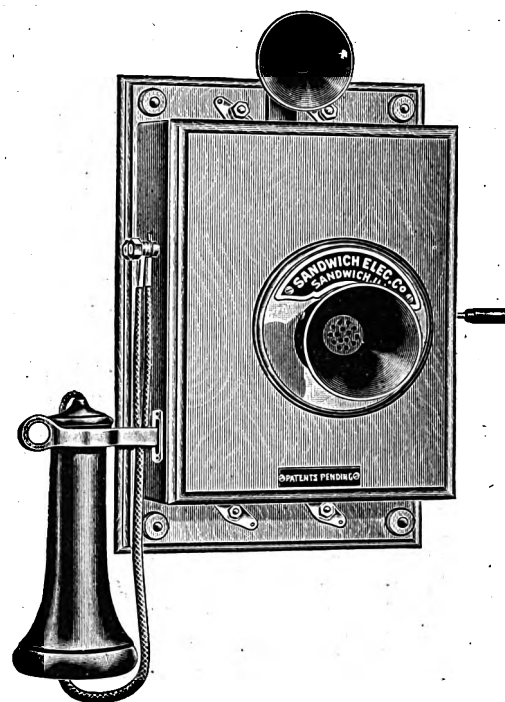
# The Use of Telegraphones by Railroads

There has been much written about the use of the telephone by railroads for assisting them in their dispatching business. This use of the telephone has already been made by several railroad companies and the only reason why the telephone has not become more popular is because there have been great drawbacks to its use in connection with the telegraph lines. There has been a considerable advance along that line recently and now portable telegraphones are on the market, by means of which it is possible to talk over several hundred miles of telegraph line without any trouble. The name telegraphone may be confused with the other instrument of the same name that was described in this magazine a short time ago, but it is entirely different and it merely means an instrument by means of which it is possible to talk over a telegraph line at the same time that messages are being sent, without confusion.

Such instruments have been used on the Galveston, Harrisburg & San Antonio railway for some time, and Mr. Percy Hewett, Superintendent of Telegraph of that company, states that they are giving good service. He writes as follows:

"We have equipped our line between San Antonio and Del Rio, with a branch from Spofford Junction to Eagle Pass. The wire on the branch is No. 8 iron. The telegraphone at Spofford is bridged between the two wires. We have equipped all of our cabooses with the instrument. For purposes of communication we use our duplex wire, which is a 210 pound copper. These instru-

ments are giving first class service and are the means of saving serious delays in freights caught at blind sidings, or in case an inferior train reaches a meeting point with a superior train where the superior train has been for some reason delayed. After waiting a few minutes the conductor attaches his telegraphone by using a connecting pole and calls up the dispatcher, states what train he has, and asks in regard to the train which he was instructed to meet. In cases of this character we have a saving of from two to five hours delay to an inferior



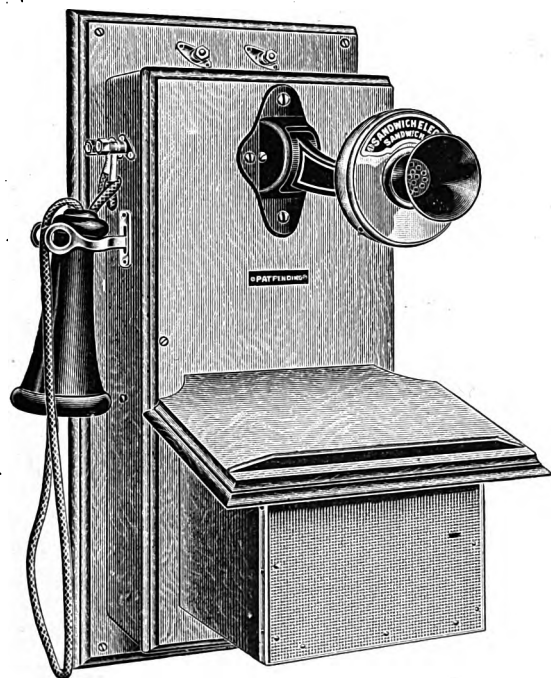
TELEGRAPHONE TRAIN SET

train, the superior train having what is called in railroad language 'Fallen down.'

"We have also installed them in bridge outfits where the gang was working on a bridge and it saves considerably, not only in money but also in time of completion of the bridge, for the foreman to be in communication so that when he needs any particular article he is enabled to communicate quickly with headquarters and have it shipped out on the first freight train. He is also enabled to obtain any special instructions which he might need on some point which might develop that was unforeseen. By calling up the dispatcher's office the superior officer is brought to the instrument and the needed instructions obtained.

"The distance over which these instruments will carry satisfactory conversation is variable, depending upon the altitude and also upon the number of wires on the circuit. In West Texas we have only four wires at a high altitude. The air is dry, therefore we carry on conversation for three or four hundred miles. When, however, we attempt any such feats in the lowlands of Louisiana, we find that it is impracticable to talk over a greater distance than about two hundred miles, working over a quad wire of 210 lb. wire."

It is easy to see many uses to which the telegraphone may be put. In case of a wreck, headquarters may be reached without delay, the track walker may notify his superior of any trouble on the track and thus prevent a bad accident. There are numerous uses that would suggest themselves only to a railroad man.



TELEGRAPHONE STATION SET

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# Meeting of the Pennsylvania Association

The third annual convention of the Pennsylvania State Independent Telephone Association, held at Allentown September 11 and 12, was without doubt, the most interesting in its history.

The delegates were welcomed cordially by the acting mayor of the city, Dr. C. D. Schaeffer. After replying in well-chosen words to the official's welcome the president of the association, Hon. C. W. Kline, addressed the members of the association as follows:

"I extend to you a hearty greeting, and congratulate you on the magnificent showing made by the Independent telephone companies of Pennsylvania during the past year. Pennsylvania does not lead the vanguard in the grand march of Independent telephony because she was a little late in starting, but in spite



HON. C. W. KLINE,

Retiring President of the Pennsylvania State Association

of this her position is well in front on the roll of states and if the steady growth of the past few years is continued the near future will find her leading the column.

"The entire state is covered with Independent telephones; hardly a town, village or hamlet within the confines of her borders that has not been supplied with Independent telephones, and the long distance toll lines are rapidly reaching out and connecting all of the local lines together so that today it is possible to reach every portion of our state over these toll lines; but right here let me suggest that only one way of bringing about a first class toll service is, in my judgment, to divorce the toll line service from the local service.

"This could be done by organizing a long distance company to which all the interests in the state could turn over their long distance lines and take an interest in the new company proportionate to the number of telephones they now operate, or upon any other basis that might be mutually agreeable to all of the interests concerned.

"The long distance lines should be under a separate and distinct management and built in a standard manner. In this way alone can we expect to give first-class long distance service and satisfactorily reach every portion of our state and connect and communicate with other states until along all lines we can fully compete with our long-entrenched competitor. We cannot talk

over inferior lines and through exchanges for long distances and expect to attract and maintain the support of the great business public unless we supply them with equally good, if not better, service than is afforded them by our competitor, and some plan like the one herein suggested, or a better one, if it can be found, should be adopted, that would weld the long distance lines firmly together, built in a standard manner, and put them under one management.

"We earnestly desire the users of telephones to look for the shield every time, and the only way we can bring about this result is to see that the telephone under the shield renders the patron prompt and efficient service.

"In looking over the short life of the Independent movement we are struck with amazement at the wonderful showing for human progress made in this time. The Bell Company, as a monopoly, catered only to the rich. Its motto was: Limited use, high charges and great profits. Under such conditions no industry can develop. Telephones were then only used by the few who could afford to pay the price. After having exclusive control of the field for eighteen years, in 1894, when its first patent expired, it had only in use in the whole United States, 291,253 telephones.

"The people over the entire land revolted against this policy. Manufacturers started to manufacture independent telephone apparatus. Companies were formed first in the west, and later in the east. Independent plants were built, at first crudely, but anything to beat the monopoly, and the grand result of this revolt of the people is shown in the fact that against 291,253 telephones that the Bell had installed in 1894, the people of the United States have now 5,000,000 telephones in operation, of which the Independents own 3,000,000 and their competitor 2,000,000, and the end is not yet in sight, and will not be in sight, until the last house is built and the last child is born.

"It was an inspiration to those who had the honor and pleasure of attending the convention of the International Independent Telephone Association of America, held in Chicago the latter part of June of this year. Representatives selected by the United States, by Canada, Cuba and Mexico to the number of 600 met in convention and adopted a constitution and by-laws, and I suggest that this convention so amend and change their present constitution that it will conform therewith. The interest there manifested showed that the Independent movement was moving on like an avalanche and that rocks in the east like New York, Boston and other centers where our competitor has heretofore been impregnable intrenched will soon crumble and be ground to dust under the grinding wheels of progress. This is the great progressive movement of the people and in the end the people will win.

"Everything has worked harmoniously in our state during the past year so far as the Independent telephone movement is concerned. The five great companies of the state, viz.: the Keystone of Philadelphia, the United, the Consolidated, the Pittsburgh and Alleghany, and the Union of Erie, practically control the situation with 120,000 telephone subscribers. Besides this, there are smaller companies at different points in the state that foot up to about 30,000 more stations, making a total of about 150,000 telephones in operation over the state. We have about 25,000 miles of toll line. We have 314 exchanges and 2,926 toll stations, and 300,000 miles of toll line circuits.

"Still the good work goes on and the people are coming to their own. Our traffic association has become indispensable and is the means of not only regulating the long distance tolls, but of bringing the companies together and harmonizing their differences. I would here suggest to the convention whether it would not be possible to avoid the dual organization of state association and traffic association by using the traffic association as the state association, and avoid the loss of time as well as expense of holding the state convention and meetings of the state executive committee.

"I have not given any detailed thought to the subject, but I believe that all Independent interests could be as well served by the traffic association as it can be by both associations.

"An earnest effort is being made by Independent companies to gain a foothold in New York City, the metropolis of the western hemisphere, and their efforts are arousing the attention of the entire country, and a resolution adopted by this



convention, voicing the desires of Independent telephone users in Pennsylvania may be timely and appropriate. Our competitor is leaving no stone unturned to hold their position and keep out competition and maintain their monopoly, but 100,000 people in New York City who have already signed contracts to take the Independent telephone as soon as installed, as well as the voice of the business communities surrounding New York City, numbering 300,000 telephones, who are asking for telephone connection with New York City, must sooner or later compel official action in favor of the Independents.

"Now a word as to the success financially of the Independent companies. Our competitor, through the public press, and by every means that unlimited capital, lavishly used, has tried to depress Independent securities and belittle the value of their plants; a campaign of vituperation against feared competition has steadily been conducted, voiced by subsidy.

"In every manner possible have they sought to depreciate the true value of the stocks and bonds of Independent companies, and capital, which is at all times timid, has often listened to their slanders and failed to extend the helping hand when most needed, and in spite of this the good work has proceeded. I quote from the article of the Honorable Francis Dagger of Canada, who as a representative of the Canadian Government, and in the interest of telephone users in Canada, made a thorough and exhaustive examination of the Bell and Independent systems in the United States. He says:

"Coming to the question of telephone competition in the United States, in view of the marvelous progress made by the Independent movement in the last few years, it becomes a difficult task to add anything to the visible evidence to be found in every state in the union. To have built up a business aggregating two and one-half million telephones, representing an investment approximating \$250,000,000, within the past eleven years is an achievement almost without parallel in the history of commerce and invention. No better guarantee, then, is necessary to demonstrate that the Independent movement has come to stay, and that the telephone service of the future will be dominated by the supporters of that movement.

"As touching the financial aspect of competition, I may say that during the government telephone inquiry in Canada, evidence was obtained from all parts of the United States regarding the result of telephone competition and statements were furnished by many Independent companies regarding the physical and financial condition of various systems. After a careful analysis of these I am satisfied that it would not be possible to find among a similar number of any other class of industrial undertakings more successful results.

"Some time ago I saw a statement showing the dividends paid by forty-one Bell companies in the United States and in order to make a comparison I referred to the information furnished to the telephone committee, and compiled a statement of the dividends paid by the Independent companies whose reports were furnished to the Canadian government. These reports from forty-nine companies, representing sixteen states, showed an average dividend of 7.76 per cent., whereas the average of the forty-one Bell companies was only 5.2 per cent. These figures undoubtedly indicate that telephone securities have reached a stage where they command the support and confidence of the public. More than that, I believe in the face of present conditions, Bell securities must decrease in value, while those of the Independents will attain a higher and more stable position as the development continues to grow.

"The testimony of the honorable gentleman from Canada is the disinterested opinion of the government expert as to the relative merits of the Bell and Independent companies in the United States, and it should inspire us with confidence in the successful future of Independent telephony with no thought of turning back or faltering by the wayside, but with a steady forward movement all along the line. Let us not cease our efforts until every business place, every home that dots the hills and dales of Pennsylvania, shall be blessed with a telephone.

"In conclusion, let me hope that your deliberations during this convention will result in advancing our cause and bettering our conditions. Take up all the business brought before you patiently and carefully and may the conclusions reached be for the best interest of the whole people of our state."

Next in order came the report of Secretary H. E. Bradley who stated that there are 147,960 Independent 'phones in the state of which but 93,766 are represented in the Association and made a strong plea for uniting all the Independents into one harmonious body.

Dr. Frank Hart, of Pittsburg, spoke about the struggle of Independent companies to secure an entrance into New York and offered the following resolution, which was unanimously adopted:

WHEREAS, we, the delegates to this convention, have witnessed the contest being waged in the City of New York by an Independent telephone company for the right to compete with the Bell monopoly that controls the telephone situation in the City of New York; and

WHEREAS, we have noted the progress made by said Independent telephone company in said contest, and have observed the popular feeling in favor of a division of the field as against a monopoly of a small part of it; and

WHEREAS, we, as telephone operators and builders, are fully aware of the lack of Independent connections between the outlying territories in New Jersey, Pennsylvania, Maryland and New York State, on account of the Bell monopoly dominating the New York situation and thus cutting off commercial connection between four great states and the City of New York; and

WHEREAS, we, as delegates representing telephone companies operating 200,000 telephones, 314 telephone exchanges, 3,000 toll stations and 300,000 miles of toll circuit; representing in money \$90,000,000 of invested capital, feel that it is our duty to lend whatever aid and encouragement we can to the Independent contest now being made in the City of New York, to the end not that the interest of any individual company may be served, but that that great metropolis may be connected with the Independent telephones in the adjacent states and that adjacent states may enjoy the benefit and convenience of connection with that great metropolis;

NOW, THEREFORE, BE IT RESOLVED by this convention that we heartily and earnestly endorse the application now being made by the Atlantic Telephone Company for a franchise to do business in New York City and we pledge ourselves to give whatever aid and assistance we legitimately can bring to bear to make that application successful.

RESOLVED, that from the delegates to this convention assembled a committee be selected, empowered and instructed to appear before the city government of the City of New York and urge upon it the necessity to the public of granting the application of the said Atlantic Telephone Company for a franchise.

RESOLVED, that a copy of these resolutions be transmitted by the secretary of the convention to the board of estimate and apportionment of the City of New York.

"Confidence in the Independent Telephone Movement" was the subject of a talk by Charles West, who was later on elected president of the association. Mr. West's remarks were well received and we take pleasure in giving them in full:

In the early history of the Independent telephone movement we all know that the world at large thought that a few enthusiasts were experimenting with something they knew little or nothing about, and that the experimenting would develop a flash in the pan and die out. Our friends, the Bell monopoly, did all they could to foster this belief, and had it not been for the dominant spirits of that day, and their confidence in themselves, there is no doubt that the present magnificent showing could not have existed.

One of the world's greatest men in days gone by said: "I believe in a man who believes in what he believes in," and there is no doubt but that this aptly expresses the feeling of the public.

The Independent movement has men back of it with the courage of their convictions. They are ready with all their energy, brains and money to back their confidence in the future of Independent telephony.

With this class of men at the helm, there can be no doubt but that the movement will grow and gradually spread all over this great country, marching steadily onward, without stopping and without faltering, to its logical conclusion.

The opponents of Independent telephony are men of vast experience and skilled in the various ways of casting doubt upon our ultimate success, and it therefore behooves us, who are gathered here today in the interests of Independence in this great state, to have the supremest confidence in the outcome, so that we may instil into our associates, our neighbors and friends the fact that in the long run we shall conquer the monopoly who are using every means in their power to dis-

credit us. If we are possessed of ambition, adaptability, power of application, resourcefulness, honesty of purpose and confidence, in the right proportions, there is no power on earth that can prevent the successful outcome of this industry.

When we have the confidence that we all have in this matter we should make it a point to instill it into the people we meet; talk it, act it, live up to it and advertise it. An old and true saying is: "Bright examples and fine courage in your convictions will inspire the ardor of those with whom you come in contact." So it is with confidence. We are entitled to the



CHARLES WEST.

President Pennsylvania Independent Telephone Association

confidence of the public. Why? Because prior to the expiration of the fundamental patents no utility so necessary to the comfort of the public was so completely a monopoly as the telephone business, and considerably less than 400,000 telephones were in operation when we first came in the field, and only the rich merchant or manufacturer was enabled to pay the exorbitant rates charged by the Bell Company.

What a change today! Over 5,000,000 telephones in use, the larger portion of them owned and operated by the Independents. What have we done for the people? We have brought the rich man's luxury into the reach of all the people, rich and poor, and now reach practically every nook and corner, every little hamlet and village throughout the country; therefore we must have and do have the confidence of the great mass of the people today.

As we have the confidence, we must make every effort to retain it. How? By fulfilling our promises, giving good service, and taking care in general of our subscribers.

We must, all of us, as individuals and by personal initiative, see to it that this is done, and must contribute our time, talents and energies to this end. In the State of Pennsylvania particularly we cannot help but have confidence in the future.

We who are operating men know that with the enormous natural resources of hard and soft coal, ore fields, ore mines, cement mills, slate quarries and numberless manufacturing industries this state has, it is destined to become one of the largest users of Independent telephone service in the country, and there is nothing can stop it, and we are confident that as time goes by we shall build up our business to an extent undreamed of a few years ago.

We should endeavor to build up our business in this state so that it will rank with Ohio, Indiana and other western states numerically, and I am of the opinion that, with a franchise for the city of New York practically settled, this should be a comparatively easy matter to accomplish, and although not wishing to pose as a prophet I have the utmost confidence that we shall all live to see a large Independent telephone system existing throughout the entire country, connected together with vast transcontinental long distance lines.

We expect, and will have, opposition. The fight has been waged in the past without quarter, and our opponents have done in the past, and are doing today, everything that cunning can devise and unlimited means accomplish; but, gentlemen, the public are aroused and are demanding some of the rights that are theirs, and I predict that if we carry on the fight along the lines that we are all working on that nothing can stop the

Independent movement from being the greatest and grandest success of modern days and we will go on from day to day broadening our sphere of usefulness for good and enlarging the lines of communications for social and business purposes until at last we may say: "We have conquered because we had confidence in ourselves."

The committee on constitution and by-laws, consisting of Dr. Charles Griffith, Johnstown; Mr. Campbell, of Huntingdon and Clearfield Co.; T. B. Lee, Green County; John Helfenstein, Consolidated Telephone Co., and H. E. Bradley, secretary Traffic Association, submitted several changes in the constitution in order to make it conform to that of the International Association. On motion said changes were adopted.

The committee on nominations recommended the following officers for the year 1906-1907:

President, Charles West, Allentown.

First Vice-President, E. D. Schade, Johnstown.

Second Vice-President, J. G. Splane, Pittsburg.

Treasurer, C. E. Wilson, Philadelphia.

Secretary, H. E. Bradley, Philadelphia.

For the Executive Committee:

C. W. Kline, Hazelton; C. E. Wilson, Philadelphia;

Edw. Davis, Philadelphia; E. D. Schade, Johnstown;

R. E. Umbel, Uniontown; W. B. Trask, Erie; C. B.

Rudy, York; W. H. Delinger, Patton; J. G. Splane,

Pittsburg.

On motion the gentlemen named by the committee were unanimously elected.

The following gentlemen were appointed members of the committee on the long distance movement: Charles E. Wilson, of the Keystone, Philadelphia; E. W. Davis, of the United; J. G. Splane, of the Pittsburg and Alleghany; Dr. Chas. Griffiths, Johnstown, and Charles West, of the Consolidated.

Papers of rare merit were read by A. J. Ulrich, Dr. Frank Hart, E. D. Schade and Chas. Russell, which will be published in full in this and in future issues of SOUND WAVES.

### Discount for Phone Subscribers.

C. W. Shimel, manager of the Shimel Telephone Company, Casey, Ill., has introduced a system in his business which is given satisfaction to himself as well as his patrons. Like many other telephone men he used to collect his monthly bills either in person or by collector. The method was both unsatisfactory and expensive. Then he concluded to try the plan pursued by gas and electric light companies of giving a cash rebate to subscribers who pay their bills at the office of the company prior to the 10th of each month. After giving the matter thoughtful consideration he concluded that 25 cents per month would be the right discount, and the favor with which the idea was received by his patrons has vindicated his judgment as to the easiest way of collecting telephone bills in Casey.

### Telephone Progress in Japan.

The Japanese Department of Communications intends to establish telephone-exchange offices at 130 more cities and towns, the work to cover seven years. The cost is estimated at over \$10,000,000. During the present fiscal year telephone-exchange offices may be established at 12 or 13 places out of 80 whence applications have been received. Some 2,000 subscribers will be enrolled at these places.

# Is Telephone Competition Desirable

By C. B. CHEADLE

The Bell Telephone Company is spending a great deal of money in an effort to convince the business men that competition is not desirable, that a monopoly is to be preferred, that that monopoly should rest in the self-constituted monopoly, namely the Bell Telephone Company. It is desirable that we look at this matter from close range and consider whether the arguments that they put forth are founded upon sound business principles or fallacies dressed up in the garb of plausibility.

One argument advanced why Independent companies should not be granted a franchise is that they are speculative enterprises. This can but provoke a smile when we remember the hundreds of millions of watered stock of the Bell monopoly. A public advertisement in our large dailies a short time ago made the startling statement that \$100 invested in the Bell telephone stock twenty-five years ago would be worth \$100,000 to-day, a statement which so far as I know has never been denied. It would indeed be surprising if some scheming, unscrupulous men did not enter such an inviting field for the working of their wiles. That such men have disgraced the cause does not admit of doubt. There has just arrived in the City of Chicago a representative of another business whose disgrace he has been, but it would scarcely be said that the banking business is disreputable because Paul O. Stensland has been engaged in it. The facts bear out the statement that the percentage of failures among Independent companies in the United States is actually less than that among national banks. And, further, the fact remains that but few of the 10,000 or more Independent companies that have been organized in less than eleven years are not made up of business and professional men, farmers and laborers throughout the localities in which the companies operate and carry on their business, and are not honestly and conservatively organized and managed. No other business has had such phenomenal growth or, taking into consideration the amount of the capital invested and the number of persons interested, been so free from speculative policies. In the state of Illinois are five hundred Independent telephone companies or organizations engaged in the business of furnishing telephone service to the people of their several communities. They are almost without exception conservatively organized, well managed and prosperous. Take up the morning's paper, if you will, and fail to note an account of any failure among Independent telephone companies, and a perusal of the files for days, weeks and months will fail to note the failure of a single Illinois Independent telephone company, and you may be assured that did they occur the Bell Company would herald the fact all over the land.

Again it is argued that the telephone business is essentially a monopoly, a "natural monopoly" if you please. The fact that practically all the cities, towns and villages of the United States, and especially in the great Mississippi basin, have granted franchises to Independent companies, and have had built therein competing exchanges, and that through such competition the number of telephones in the United States has grown from less than 300,000 in 1894 to over 4,000,000 in 1906 is sufficient proof that it is not a "natural monopoly."

But, you contend that the establishment of two telephone systems in a city is illogical and represents an economic waste. This is the stock argument of the Bell Company, and I crave your indulgence for a brief season in paying it my respects. In the first place, with the immortal Patrick Henry I say that "The lamp by which my feet are guided is the lamp of experience." That man is strongest who grasps the lessons of the past and makes of them the pole star to guide his footsteps into the unexplored realms of the future. The Bell Telephone Company enjoyed the monopoly of the telephone business for over twenty years to an extent never enjoyed by any other public service corporation; a monopoly so absolute as to be perfect. During that time its aim and purpose, judged by its conduct, was to teach the people that the telephone is a luxury; that only the wealthy could hope to enjoy its blessings, and at the end of twenty years less than 300,000 telephones were in use in the whole of the United States. At the end of that time there was not a single farmhouse in the state of Illinois, and I believe in the whole United States, in which a telephone was installed, and as late as 1897, in the great county of Will, in which I reside and which extends to within less than twenty miles of Chicago, the metropolis of the west, there was just one residence telephone in service in the county outside of the city of Joliet itself, and for that the user paid \$125 per year. In less than ten years thereafter, under competition, practically every farmhouse has a telephone, many of them paying as low as \$12 per year, or even less, and instead of 600 telephones in the county there are over 9,000. After twenty years of so-called development there was not one telephone for every 300 population under monopoly, while after eleven years of competition there is one telephone for every twenty inhabitants in the United States.

It must be true then, that either enlarged telephone service is a curse, or competition is a blessing. Not only are the facts truly stated as regards the United States, but the truth of the statement that competition is essential to growth and development is emphasized by comparisons with conditions existing in other enlightened nations. In Great Britain, where the average of intelligence is at least approximately the same as our own, the proportion of telephones to population is as one to 116; in France as 1 to 500; in Germany 1 to 108; Bavaria 1 to 129; in Austria 1 to 734; in Belgium 1 to 293, in all of which countries private or governmental monopoly exists, while in the city of Stockholm, which is one of the most remarkable examples of growth under competition there is one telephone to every 6 inhabitants. Mr. Dagger, of Winnipeg, Manitoba, a telephone man of over twenty-five years' experience was employed by the Canadian government as a telephone expert to a select committee of the Canadian parliament, which was charged with the investigation of telephone conditions in Canada and throughout the world. He says, after years of careful investigation: "I know of no place where monopoly, either private or governmental, is giving an adequate telephone service, and I have no knowledge of a fully developed competitive telephone system which has ever

failed to receive a larger patronage than that of a monopoly."

But, you say, it is expensive to have two telephone systems. Under competition the cost of each connection to the telephone subscriber has been reduced approximately from prices ranging from five to twelve cents per connection per annum under monopoly to prices ranging from one-half of one cent to two and one-half cents per connection per annum under competition. The value of a telephone service to the subscriber is in proportion to the number of local connections which it gives him. Again, I say, either enlarged telephone service is a curse or competition is a blessing.

Not only is competition essential to development, but it is necessary to the acquirement of efficient and popular service. Again I appeal to your experience and ask my readers who are blessed with retentive memories, how well you remember the exceedingly courteous treatment with which your complaints were received when your telephone was out of order or service unsatisfactory; how the company voluntarily came to you and told you that it had been charging you too much for its service and proposed a reduction in the price of the same; how they frequently replaced their old equipment with new and up-to-date appliances; seeking always to make their service the best and their prices the most reasonable and the treatment of its patrons most satisfactory. How they built lines where desired, installed telephones in farm-houses and everywhere else where requested at popular prices, bringing friends and relatives together, annihilating distance and adding greatly to the measure of human happiness. You may remember these things, friends, but I confess to a slight aberration of memory that renders it impossible for me to so recall these circumstances. I do remember, however, the insolence of the employes, the exorbitant prices, the execrable service, the refusal of the company to install telephones anywhere except on terms that would return to it an enormous profit, seeking always the filling of its own coffers regardless of the rights of the public. On the other hand, since competition has exerted its magic spell I have seen prices reduced one-half, service bettered to an extent deemed impossible, telephones multiplied by ten and all within the short period of scarcely more than one-half score years. In the light of history, of the making of only yesterday, no man possessed of normal faculties can question the fact that competition in the telephone business has been essential to growth and development.

But, you say, two telephone plants in a city represent an economic waste. I read and know of a great and complex system of city, township, county, state and national governments with their three great departments, legislative, executive and judicial, the grand object and hope of all of which is to secure equal rights to all men.

But what is the occasion for all this? Why take from the people billions of dollars each year for governmental expenses? Why do not men govern themselves without expense to themselves or others? I have said the grand object and hope of government is to secure equal rights and protection to all alike. This implies that without governmental intervention you and I would not accord to our neighbors the rights which we would enjoy, nor would they accord to us on terms of equality the rights which they enjoy. If they would, if you and I would do even and exact justice to our neighbors, and they to us, and every one else to his neighbors and they to him, then

it is manifest that moneys expended annually in sums so stupendous that the human mind is not capable of grasping their meaning would represent an economic waste. The fact of the matter is governments are established, laws made and executed, moneys collected as taxes, prisons built, police forces established, and the countless instrumentalities of government now forming a part of our economic system are established because of the frailties of men; because they are not strong enough and good enough to always do everything they should do, and leave undone the things they should do. As long as men are what they are government will be necessary, with the economic waste represented in the establishing and operation of its delicate and intricate machinery. Corporations are composed of men, not perfect men, but just common, ordinary men. The corporation itself will reflect the average of the intelligence, industry and honesty of the men composing it. If a perfect organization, perfectly managed, composed of perfectly honest, perfectly fair and perfectly wise men would have charge of the telephone business of the city of Chicago, for instance, a company that would charge the public just enough to maintain itself with a perfectly fair return upon the investment, then it would be conceded that the establishment of another system, paralleling the lines of the first, duplicating its equipment and expense of operation and maintenance, would be an economic waste; just as if all men were perfectly honest, perfectly wise and perfectly fair, each rendering to the other an equal amount of service, contributing an equal amount of his time, talents and energies toward the common good, the establishment of a government, the setting in motion and maintaining its intricate and elaborate machinery would represent an economic waste. When experience shows that securing to each individual equal rights with all others can be obtained only through governmental intervention, then I am ready to believe in government, and to contribute my portion of the moneys necessary for its establishment and maintenance without feeling or believing that it is an economic waste. The benefits which I derive therefrom affords to me happiness and enjoyment a thousandfold more precious than the investment of the same money in any other way could produce. And if experience teaches me that men are human, that corporations are swayed and influenced by the frailties of the men composing them, that the character of the service which it renders to the public is determined by the whim, caprice or convenience of the corporation; that the prices charged are limited only by the patience, long suffering and ability to pay of the people who chance to be its victims; that by competition has been found means to stimulate, develop, enlarge and better the service the corporation furnishes, to make reasonable prices, to popularize the utility, and that only through competition can that end be attained then I am ready to welcome competition as a blessing and to deny the charge that competition in that business represents an economic waste.

And, finally, if any further proof were needed of the imperative necessity of competition it is found in the unscrupulous means employed by the Bell monopoly to fasten itself upon the social, domestic and business life of our people. Its system of disseminating false statements for facts, its control of the financial influences of the great money centers of this country, that enable it to say to the trust companies of Philadelphia: "Do not touch the securities of the Keystone Telephone Company," under



penalty of destruction; its system of all but blackmail, more extended, more relentless and more coldblooded and heartless than even that of the Standard Oil Company itself, proves it unworthy any confidence on the part of the people, even if we ignored its past. The people through the organization of 10,000 companies have made a new declaration of independence whereby they have become emancipated from the shackles of monopoly.

They have asserted their prerogatives as free men, they are willing to pay a fair price for what they get, but they demand the best that their money will buy. They believe in a square deal, they believe in the manhood of their president, they believe in the integrity of the people, they are ready to fight and die for their government because it stands for freedom, protection, happiness.

We as telephone men of the people can trust the people to sustain us just so long as we are worthy of their confidence. Depend upon it, the people can be trusted to the uttermost.

### Telephone Monopoly in Japan.

When a Japanese dies in Tokio one of the assets of his estate is his telephone, and the privilege of taking over the dead subscriber's instrument is worth, according to the Boston Financial News, just \$400 to his heirs.

The government of Japan is interested in telephones for the reason that such instruments of communication are a monopoly in the little empire—a government monopoly. It is a fact of worldwide recognition that governments as a rule do not pay particular attention to industries which they may happen to possess a monopoly of—and this maxim is apparently true of Japan, though it is possible that Japanese telephone systems may be modernized.

The great complaint in Japan is not so much against the quality of the instruments and equipment of the systems as against the total inability of the government to supply service to all would-be subscribers. To get a telephone in Tokio a man either has to buy out a subscriber or wait his turn to secure an instrument, and there are no fewer than 8,000 people on the waiting list ahead of him.

The government is unable to supply the demand, for the simple reason that it has not the instruments, and has not the working force to install the telephones if it had them.

In Japan telephones are rented to subscribers at a flat rate; it makes no difference for what purpose they are used. A telephone for a private house costs just as much as one for a business office. In the city of Tokio, which has a population of a million and a half people, there are 22,000 telephone subscribers and thousands more who would willingly give \$100 to secure accommodation.

The cost of a telephone in Tokio is \$40 per annum, and that is gold, not silver, and the amount is payable strictly in advance. While the receipts of the government from its telephone monopoly are large, the cost of operation is comparatively light. For instance, it pays its linemen, the best of them, at the rate of fifty cents per day, and the nine-hour day has not yet been introduced in Japan. Switchboard operators are hired by the month, and they are paid \$5 per month.

Notwithstanding the fact the net earnings from the telephone system of Tokio are very large and there is therefore every incentive to supply as many customers

as possible, the government has so far found it impossible to keep even with the demand. In Tokio alone it is estimated that some four years will elapse before the government will be able to supply an instrument to the last man who puts his name on the waiting list. Of course many would-be subscribers die before their turn comes, and the man has the doubtful consolation of knowing that chances may throw an epidemic of disease among those on the waiting list, and, though he be spared, his chances of getting an instrument during his lifetime are immeasurably increased by the deaths of the others.

### Stromberg-Carlson Is Prosperous.

The present condition of the Stromberg-Carlson Telephone Manufacturing Company was discussed at a meeting of bankers and trust officers recently held at the company's offices at Rochester, N. Y., and a most favorable impression was made by the figures presented.

A statement of the sales of the company since 1903 was submitted at the meeting. This showed that the sales of the company for the first eight months of 1903 amounted to \$1,694,125.45; for the same months of 1904, \$2,120,338.79; the same months of 1905, \$2,271,156.74, and the first eight months of this year, \$3,329,945.10. The gain for the first eight months of this year over the same months last year is, therefore, seen to be \$1,058,428.36.

A balance sheet from the company's books, taken on June 30, of this year, was also submitted at the meeting. This follows in condensed form:

ASSETS.	
Real estate (plant and equipment).....	\$1,525,017 61
Good will and patents .....	1,716,082 77
Merchandise (raw materials, product finished and in process) .....	2,336,028 04
Investments .....	15,106 29
Accounts and notes receivable .....	3,859,657 39
Cash in bonds and on hand .....	58,653 92
Totals .....	\$9,510,546 02
LIABILITIES.	
Capital stock—	
Common .....	\$4,500,000 00
Preferred .....	1,500,000 00
	\$6,000,000 00
Real estate mortgage (Chicago property) .....	80,000 00
Notes payable .....	2,105,000 00
Accounts payable (including dividends accrued to date) .....	721,108 45
Reserves—	
For depreciation .....	\$128,770 87
For doubtful accts .....	31,058 53
	159,829 40
Surplus .....	444,608 17
Totals .....	\$9,510,546 02

### Poles Preserved by Creosote.

Cedar is rapidly becoming a thing of the past and is now almost beyond the reach of pole users in the southwest. Its place is taken largely by creosoted butt cypress. In its natural state cypress, like all other timber used for poles, will rot in the ground or, more properly speaking, will rot near the ground line, while the portion above ground is yet sound and good for years of service. Preserving companies are now treating cypress as well as pine poles by giving penetration of creosote which process, it is claimed, insures long life to the part of the pole that is under ground.

# Manitoba's Telephone Policy

By HON. COLIN H. CAMPBELL, ATTORNEY GENERAL

(Address Delivered Before Canadian Independent Telephone Association at Toronto, Sept. 5, 1906)

It is an exceedingly great pleasure for me to be here today on behalf of the government of the province of Manitoba. I presume that this government is the only government represented at this convention, but if I mistake not it will not be long before the government of Canada will find it to their interests to be identified with this movement.

Allow me, in the first place, to thank Alderman Graham for his address of welcome on behalf of the city of



HON. COLIN H. CAMPBELL,  
Attorney General of the Province of Manitoba

Toronto. We, in the telephone interests owe the city of Toronto a great debt of gratitude. The city of Toronto has been foremost in the fight and has rendered splendid service in the past, and if they have not received that measure of support that they deserve I trust that they will get it in the future. I think that they have no reason to complain of the support that the government of which I have the honor to be a member has rendered them along these lines, and will be ready to render in the future, because the interests we represent, I believe, are the interests of the people.

In speaking of this matter, the government of Manitoba took it up because they believed it to be imperative in the interests of the common people of the country that the telephone should be more widely used and extended than it now is. We believe that the days of the telephone are just beginning, and that it has become such a social necessity that it is absolutely necessary that it should be taken hold of by interests that would place it in the hands of the people at the lowest possible cost and give them the service to which they are entitled. We in the west represent interests which possibly are somewhat different from the interests of this association, yet I believe we

are all working along parallel lines and with the same object in view.

It is now about three years since I took up this question, along with the premier of the province, and we have been making a very careful study of it ever since, trying to make such progress as we could along telephone lines. We have made progress, but perhaps not all that we expected. However, we are not discouraged or dismayed. Notwithstanding that we have not received the co-operation or the legislation which we believe we are justified in expecting from the government or the house at Ottawa, yet we think that we can, as a province, move along lines that will be beneficial.

In the west you all know that we are somewhat isolated from the east. Lying to the west of Lake Superior is a country which we think—we may be pardoned for that belief—is the greater Canada. Not greater of course in what it has been, but in what is to be. We are widely separated from the rest of the provinces, and it seems to us that we can act along lines independent from any action by the government at Ottawa.

Our government, as I have said, have made a very close investigation of this matter, and have come to certain conclusions, and it is those conclusion that will be submitted to the people of the province of Manitoba at an early date, and if they receive the endorsement which I think we can reasonably expect, then I believe a new era along telephone lines will be commenced in that province.

It was my pleasure a little over a year ago to preside upon a commission of the Manitoba legislative assembly, composed of both sides of the house, liberals and conservatives. The leader of the opposition was upon that commission. We spent a considerable time in its investigation, and I wish to say this at the outset that the movement in Manitoba is not a political movement in the ordinary sense that "political" is used, but it is a movement necessitated by the conditions and by the belief of our province of the great benefit that will result to the province if we accomplish it. Now that commission, composed, as I have said, of both sides of the house, never had a division. We came to an unanimous conclusion upon the committee and we came to an unanimous conclusion in the house. There was not one dissenting voice, either upon the committee or in the house, upon the conclusions we arrived at, and that was that long distance lines should be owned by the government, and that as far as possible the municipalities should own and control the local exchanges, the government giving, as we believe it is our duty to give, an intercommunication between the exchanges that will enable them to operate successfully, and by so doing remove one of the greatest obstacles, I believe, in the advancement of telephone interests; that is to say, the local exchanges are handicapped by reason of not having that long-distance communication which is essential to their satisfactorily working out.

We journeyed of course in our investigations to the great American people to the south of us, and there we received a great deal of information; and while I was always a great admirer of the American people—and I am glad to notice a good many of them here to-day—I came

away from that country with a greater admiration than I had heretofore possessed because of what they had done along the lines of independent telephones for the people.

If some great novelist could clothe the struggle that has gone on in the United States along independent telephone lines, if some man like Upton Sinclair or Winston Churchill could write the history of the struggle for independent telephones in the United States, it would possibly be, in my judgment, one of the most interesting features of life upon this continent, because they entered upon a struggle and had a battle which was intense in its interests, and which, for the weapons used against them, was probably the most disreputable commercial fight ever fought on this continent. The opponents of that system there used every kind of intrigue and falsehood and manoeuvre that was possible to thwart the interests of the people upon telephone lines. But the people of the United States rose in their might, and when the people rise, as I believe they will on telephone lines, the people are King, notwithstanding what the monopolists may say to the contrary. The interesting struggle and advance of telephones in the United States is marvelous, and the results that they have accomplished are such of which they may be proud.

Now, I do not think the Canadian people are less virile or less public-spirited than our American cousins to the south, and the time is coming when the Canadians will, like the American people, put their shoulder to the wheel and accomplish that which is in the interest of the common people of the country; and we, as a government, believing it to be right that we should help in this struggle, believe that also it will not redound to our discredit politically for the interest we shall take in this movement.

I do not, in the presence of the American gentlemen present, attempt to review the struggle that took place in the United States. Possibly all the gentlemen here are more familiar with it than I am. But the results of that movement there, and what they have accomplished, had a most important effect upon the people of the west. We, as you know, are getting a large number of American settlers in the west. They have come with the results of the telephone war or telephone struggle very fresh in their minds, and they have been and are imbuing the Canadian people of the west with the advantages that result from the more extended use of the telephone.

We are, as you know, in the west largely an agricultural people. While we have a big city, a city that is to be much larger possibly, I will not say the first or second in Canada, we are on the whole, and will remain for many years, agricultural, and prairie agricultural at that, and with a wider extension of the use of farming instruments the area that a farmer will cultivate is much larger than heretofore, and the result is that we have an isolation of the farming community which is detrimental to the agricultural interest, because the farmers who are isolated feel that isolation very much and they endeavor as quickly as possible to remove from the farm to the town. We believe it to be desirable, in the interests of our agriculture, that we should as far as possible remove the isolation and give the farmers the benefit of the boon of the telephone, and we believe in so doing we will remove one of the greatest disaffections that exists in so far as life upon the prairie is concerned.

Now, we have not had very many facilities given to the farmers for the use of the telephone, because I believe they did not consider that it paid; but, Mr. Presi-

dent and gentlemen, since the opening of this year, since the matter has become of public interest in the west, we have had a most remarkable progress by the company of which you all know. Manitoba has received such attention from their hands that they have made remarkable progress and development during this summer. I don't know what has come over the company that they have got this hustle on, but certainly it is the most vigorous hustle they have ever made in the extension of the system to the towns and to the rural parts of Manitoba. So great a hurry have they been in that although the government desired to make some advance this year we found that every bit of available material in that whole country was bought up by the company, who desired to retain a monopoly in telephone matters. We believe we will be able to rectify that very shortly.

Now, Mr. President, in the investigations that were held in the province of Manitoba, extending to the middle states and one of the eastern states, we came to this conclusion, that it was desirable that the local system should be owned by local people and should be operated by them, because, first of all for this reason, that the telephone is a utility which is so closely personal in its use that it is absolutely necessary to have the management of that utility as close to hand to the utilizers of a telephone as possible. You are thus quickly able to rectify any errors or mistakes or disagreements or make improvements that are demanded in the interests of the people. If you have your management a long distance from the place of operation you have the greater difficulty in removing the cause of the dissatisfaction. I found also that the best asset that the independent telephones of the United States possessed, an asset that is unpurchasable, and which is not and cannot be purchased by a monopoly, is the asset of the backing of the local people, the interests of the people locally in the telephone. That is the underlying asset of greatest value to local concerns, because thereby you insure, notwithstanding any warfare that the opposition may bring, the support of the people. Without that asset I do not think that the independent telephones of the United States could have survived the struggle that took place between them and the monopolists.

I do not know whether the judgment or conclusion that we reached is one that our friends from the United States would reach or not, but that was our judgment and conclusion. We also found this, and that was the greatest difficulty in successful operation in the United States, that the local telephones did not possess the means of intercommunication that was desirable, and possibly the long-distance communication was more expensive than it ought to be by reason of the fact that there was not the service by long distance that was necessary to make it a success; and in talking with a gentleman from Wisconsin, Mr. Valentine, I think, who was the president of the Wisconsin Independent Association, he pointed out to the commission this important fact, and one that weighed with us very much, that it would be an ideal service if the state or government or some strong corporation should construct and own a long-distance line which would give to the independent companies that means of intercommunication. So, gentlemen, we thought, insofar as our province was concerned, that the best way we could advance these interests was for the government itself to build, construct, own and operate the long distance lines and give to the people that means of intercommunication.

So, sir, we resolved upon this policy, a policy of government ownership of long distance lines and municipal ownership insofar as local lines are concerned. And the government have made this offer to the municipalities: We have said we are willing to construct and will construct the long distance lines, but we ask you to submit to the people of the province at the municipal election, which will be held in December next, a simple question, whether or not you desire to have your local systems owned by your municipalities? If the result of that vote is favorable, and the government engineer or expert finds that there are sufficient people desirous of having the use of the telephone in the province or in the municipality, we will, as a government, endorse your bonds so that you may be able to get your credit for that purpose at as low a rate as possible.

Now, sir, we submit this question to the people of the province apart from any politics; we submit it as a municipal question, and we will await the result of that appeal, I think with confidence and with assurance; because this is the first time, and we are the first province to give to the people the right to say whether or not they desire to have their telephones owned by themselves, operated by themselves in their own interests. We did this because, as I said at the outset, we desired this to be disassociated as far as possible from politics, because our opponents are very astute, and they would endeavor, if possibly the chance were given, and we have seen indications of it, to try to get the question mixed up in some way or other in a political turmoil; and I think that every one here present will agree with me that it is most undesirable that there should be any politics connected with the movement. It is a movement not in politics, but for the interests of the people. Now, that question will be submitted, as I say, and we look forward to the result, as I have said, with confidence. But before I speak further I would like to read to you some of the conclusions to which the committee, of which I have the honor to be chairman, came to; and this is one of their findings. I read this because of any encouragement it may give to the Independent telephone movement in Canada: "It was found that the Independent companies were all competing successfully with the Bell telephone systems, having a profitable margin after the original rates have been practically cut in two. Everywhere the entrance of such companies into the field had resulted in the furnishing of satisfactory service at much lower rates than had previously obtained and in the immense extension of the use of the telephone."

Now, apart from the question of finance entirely, I think you will agree with me that the extension of the use of the telephone is one of the most desirable things that could happen to the people of Canada.

Now, gentlemen, I see a map here showing the Independent telephone lines of Indiana. In examining that system, what did we find? We found in the state of Indiana, with less than one-half of the population of Canada, probably a little over a third, that they had more independent lines than we had telephones in all Canada; that the number of independent lines in the state of Indiana was twice or three times the number of telephones in the whole Dominion of Canada, apart altogether from the question of how many the Bell telephone company had in Indiana. Yet the work that had been done by the Independent telephone companies of Indiana had resulted in this very beneficial result that the telephone had been extended to such an extent throughout the state of Indiana that it would be regarded in Canada as almost un-

believable. Not only was that done in Indiana, but in other parts of the United States.

As I said before, I believe the greatest boon we can render to our Canadian people is the extended use of the telephone. I was very much struck a year or so ago in reading in the *Electrical World* something of the future that might be expected from telephones, and what the condition of affairs would be if we were deprived of the use of the telephone. It went on to say this: "This paper now, and what it was thirty years ago, is graphically illustrative of the progress made in electrical science and invention. To my mind the greatest invention within or without this span is the telephone. The electric light is a priceless boon, the trolley is a great utility, wireless telegraphy a wonderful achievement, but the telephone is all these and a blessed benefactor in human affairs as well. Its sublime simplicity and marvelous adaptability transcend all comparisons in the domain of pure and applied science. The extension of audible speech transmission from a stone's throw to a thousand miles, with a quieter inflection, is a work unrivaled. The world could better afford to go back to the 'penny dip' and the stage coach than give up the telephone."

Now, it is for the extension of this boon to the people that we are assembled here to-day. We, as I have said, are not identical in our interests, yet we are moving along educational lines, and I come here to-day because we desire to show our sympathy with this movement, and we are not afraid to show our sympathy, and we are not afraid of trusting the people upon this matter; and we come also because we desire to keep in touch with the movement, to become acquainted with what is being done and what may be expected, so that we may intelligently move along the best lines. I have come here to-day also, and I am pleased to announce, that the government have been able to secure the services of Mr. Dagger, in order that he may advise with us and will do that which will be for the better accomplishment of the results that we desire to attain. We believe that we will be able to work our long-distance lines at a profit. We do not desire a profit; we desire to render that service at as low an amount as is possible with sound finance, and we believe that in giving to the people the opportunity of obtaining their money at a low rate, we will give to them the opportunity of obtaining a telephone at a low rate. What has been accomplished in the United States will be accomplished in Canada. More people use the telephone to-day than used it yesterday, and more will use it to-morrow than used it to-day, and so on; the work will be extended until the time will come when the artisan, the farmer and the man not rich will be able to obtain and use and have the benefit of this boon, and it will not be restricted to the use of the luxurious rich; and in so doing we do a beneficial work, we do a work calculated to best advance the interests of the Canadian people as a whole. We believe you will be able to accomplish, and the government of our province will be able to accomplish, the result that will cut the cost of the telephone in two and will give them a much better service than they have heretofore enjoyed.

In our investigations in the United States we found this, that the causes of complaint against the Bell Telephone Company were along lines something like this: That the people needed a better service, that they needed a cheaper service, but they needed a service less Russian in its methods than they were accustomed to have. I do not think that the people of Canada will be any less re-



sentful of Russian methods than the people of the United States were, and we believe in being a free people, and we believe the utilities that are to be possessed by the people should be enjoyed by them at as reasonable rate as possible.

It seems to me, Mr. President, to be the fate of monopolistic interests that they become so imbued with their own importance that they turn a deaf ear, and also a blind eye, to the interests of the people as a whole; in other words, they in their methods and operation destroy themselves. One of the greatest fallacies of the Bell Telephone Company is that the more extended you have the use of your service the greater will be its cost. Now, Mr. President, if that is the fact then your struggle and the struggle of the government of Manitoba will be in vain. But, sir, I do not believe that to be, nor do the statistics or facts bear out the representation of the Bell in this regard.

Mr. President, I think I have occupied your time at too great length. I would desire in conclusion to thank you, sir, for the opportunity and for the kind invitation you extended to the government to be represented here to-day, and also for the opportunity that is afforded me on behalf of the government of coming in contact with those who are engaged in the same struggle as ourselves, to wish you the success that I am sure will crown our efforts, and to assure you of the sympathy and support of the government of the province of Manitoba along any lines, legislative, sympathetic, or by influence that it is possible for us to exert, and the repayment to us, if successful, will, we trust, be, and we know it will be, the gratitude of our own people and the benefit that we will give to the people of Canada as a whole.

#### **Detroit Home Telephone Company.**

The plant of the Home Telephone Company of Detroit, Mich., is being built by the Electric Construction Company, of St. Louis, Mo. The work of building the big plant is being done by the construction company without a cent of profit. The same interests control the telephone company as well as the construction company. The officers of the Electric Construction Company are Max Koehler of St. Louis, president; Sam. B. Jeffries, of St. Louis, treasurer; W. B. Woodbury, of Detroit, general manager, and W. C. Polk, of Birmingham, Ala., chief engineer. Charles H. Ledlie, of St. Louis, is consulting engineer for the telephone company and his representative on the ground is Joseph Lillich, of St. Louis.

The Commonwealth Trust Company of St. Louis is financing the proposition and its representative on the ground is W. W. Grayson, formerly of the Kinloch Telephone Company.

The company has purchased for the site of its central exchange property at the northwest corner of Madison avenue and John R. street, a site 105 feet on Madison and 100 feet on John R. street. The detailed plans and specifications contemplate a building to cover the entire lot, three stories, and devoted entirely to local and long distance telephony. It is expected to have this building ready for occupancy by May 15, 1907. Telephone experts who have gone over the plans pronounce them the most complete and best adapted to telephone purposes of any plans ever drawn and calling for the most modern telephone building yet constructed. The first floor, containing 10,000 square feet is devoted to public and executive offices of the company. The accounting and

contract departments open across from each other at the entrance to the building. The offices of general manager and engineer and the board room are also on this floor. The second floor is devoted to long distance board, hospital, rest room and lockers for the operators, terminals, battery room and office of the long distance wire chief. The third floor is for switchboard exclusively. Under the building is a large basement for shops, storage purposes, etc. The exterior is very attractive in cut stone and fancy brick. Construction work has been actively under way since July 16 and nearly a million feet of the subway is already in the ground and a great many of the terminal poles in the Central exchange district set.

The company has purchased for its east exchange property at the corner of Field and Sylvester, just off the Boulevard and for the relay office property at the corner of Artillery street and Lafayette. The work on modern branch offices on these sites will commence shortly.

Back of the Detroit proposition are some of the strongest men in the country, Adolphus Busch, Edward Faust, Henry Koehler, Arthur W. Lambert, of "Listerine" fame, Max Koehler, Hugo A. Koehler, Herman C. Stiefel, Ben Altheimer, C. Marquard Forster and many others.

It is expected that the plant will be ready for operation some time during the summer of 1907. The plant is being built underground, etc., for 30,000 telephones.

The Home Telephone Company of Detroit, which is becoming such an important factor in the Independent field, has the following officers and directors: President, Clarence M. Burton, Detroit; first vice president, Max Koehler, St. Louis, Mo.; second vice president, C. Marquard Forster, St. Louis, Mo.; secretary-treasurer, C. H. Hood, Detroit. Directors: Henry Koehler, Jr., St. Louis, Mo., Arthur Lambert, St. Louis, Mo., C. M. Burton, Detroit, Sam B. Jeffries, St. Louis, W. W. Hannan, Detroit, T. A. E. Weadock, Detroit, C. M. Forster, St. Louis, Mo., W. B. Woodbury, Detroit, A. N. Edwards, St. Louis, Mo., and Elias Michael, St. Louis, Mo. The executive committee consists of C. M. Burton, chairman, W. B. Woodbury, secretary, C. Marquard Forster, Max Koehler and A. W. Lambert.

#### **Sedan Chair Telephone Box.**

The latest pattern of telephone box is a genuine Sedan chair. A telephone in a boudoir or drawing room is unsightly, but a woman in London, England, has solved the problem of combining the useful with the ornamental. She had in her possession a genuine Sedan chair, the panels of which are decorated with delicate paintings, and the inside lined with pink satin. Opposite the cushioned seat she has had her telephone fixed, and an electric light enclosed in a rosy shade.

"We have executed several orders for Sedan chair telephone boxes," said the manager of a London firm, "One of the prettiest was designed in white and silver, the lining being of pale green silk.

"But Sedan chairs are not the only novel form of telephone boxes. A lady has had a miniature tent of rose-colored silk erected in one corner of her boudoir. A colored Japanese lantern hangs inside, and nobody realizes that it is not only for show until the curtains are drawn and disclose a telephone."

# Municipal Franchises and Telephone Companies

By DR. J. S. CASTER

(President Iowa League of Municipalities and Ex-Mayor of Burlington, Iowa)

There are probably no other public utilities that are so important to the growth and welfare of a municipality as those controlled by franchises, yet there is no other instance in which a municipality's rights are so infringed upon as by companies and corporations holding franchises. When company or corporation seeks to secure a franchise from a municipality, or extend one it already has, the first step is to convince the business men that it

vate company, should it not be of more value to the municipality than the mere asking for it?

The time is near at hand when municipalities must begin looking for revenues for support from other sources than bleeding the poor taxpayers for all the burden.

If these franchises are of so much value to private individuals why should they not be of value to your municipality? Why should they not be compelled to pay a small per cent of their gross earning to help support the municipality that protects them in their franchises? Too often close investigation will reveal the fact that the holders of the franchises have not been, or are not now, paying their just proportion of the taxes.

Do not understand me as being against companies or corporations; for I am not by any means; on the contrary, no municipality can amount to much that has neither companies nor corporations doing business in it. I simply mean that they should carry their proportion of the public burden.

A question of justice for the consideration of every municipality in Iowa is that of the telephone franchises. The Iowa Telephone (better known as the Bell Telephone Company) and probably a few other telephone companies that were doing business prior to March, 1882, saw the great advantage it would be to them to be classed with, and have the same rights as the telegraph companies. The telegraph is a public utility of the state, as it cannot exist upon the support of any one municipality, and does not obstruct our streets and alleys except to run through the city, and perchance a local office in the city, while the telephone companies cannot exist without the municipalities. They must use many more of our streets and alleys before they become self-sustaining, therefore are municipal more than a state utility. The telephone companies secured the adoption by the 19th general assembly of the following amendment:

"An act to amend section 1324, chapter 6, title 10, of the code of 1873.

"Be it enacted by the general assembly of the state of Iowa; Section 1—That section 1324 of the code of 1873 relating to telegraphs be, and the same is hereby amended by inserting after the word 'telegraph' in the second line thereof the words 'or telephone.'

"Section 2—This act being deemed of immediate importance, shall take effect and be in force from and after its publication in the Daily State Register and Daily State Leader, newspapers published at Des Moines, Iowa. Approved March 16, 1882."

These two innocent words "or telephone" inserted in this section means that the telephone companies doing business prior to 1897 can utilize every street and alley in your cities without ever troubling themselves to consult your wishes in the least.

But the competitors, "local telephone companies," who start an exchange after the adoption of the code of 1897, must secure a franchise from your municipality and be governed by it.

Is there any justice in this? Why should the Bell Telephone, or any other telephone company, have any more right to monopolize our streets and alleys than any other public utility?



DR. J. S. CASTER

President of the Iowa League of Municipalities

would be a good thing, or that it is needed; it then places the council in a compromising attitude to secure this good thing. In order to get it they feel they must make some concessions.

In doing this the average councilmen, through their eagerness to secure this or that good thing, forget that the company or corporation has the best legal talent it can secure to look after its interest, and to insert clauses in the franchise or contract that are solely to the interest of the company or corporation seeking the franchise. Too often when the franchise is fully understood, the very men that voted for it and used their influence to secure its adoption are themselves surprised to find the municipality so securely tied up; therefore, it is the duty of each member of the council to make himself familiar with every clause in a franchise or contract before he casts his vote for it.

In all cases the franchise is claimed to be of no value to the parties, while seeking to secure it, but how quick the tune changes after its adoption. If you seek to purchase one from the party that holds it, it is worth thousands of dollars. In many cases it represents the controlling interest in a large corporation; it is then very valuable property; but what is it worth to the municipality that granted it? If it proves so valuable to a pri-

If the law says the water and gas works, electric light and power plants, street railways, new telephones and other utilities must first secure a franchise from the municipality in which they wish to do business before they remove one shovel of dirt, why not the old telephone companies, when they wish to make any extension in the service?

It is evident to my mind that it was the intent of the law to protect the municipalities against individuals holding perpetual rights to public utilities when section 955 of the code of 1897 was enacted, part of which reads as follows: "They may also grant individuals or private corporations the authority to erect, maintain, or purchase such works or plants or railways, street railways, or telephone system, for the term of not more than twenty-five years, but no exclusive franchise shall be thus granted, extended or renewed, and no franchise shall be granted or authorized until after notice of the publication thereof has been published once in each week for four consecutive weeks in some newspaper published in such city."

Further evidence is given of this in the enactment of section 776 of the same code, part of which reads as follows: "No franchise shall be granted, renewed or extended by any city or town, for the use of the streets, highways, avenues, alleys or public places for any purposes named in the preceding section unless a majority of the legal electors, voting thereon, vote in favor of the same at the general or special election."

But the old telephone companies are not as yet affected by any of these grants given cities or towns. By the core, as the supreme court holds, they are not required to secure a franchise from the municipalities of Iowa in which they were doing business prior to the adoption of the code in 1897, because the bill requiring all new telephone companies to secure a franchise was not so worded as to take in those desiring to make extensions that were at that time doing business in the state. Why should they be permitted to take for their use any street or alley without a franchise any more than a street car company? If the street car company has a franchise for certain streets and wishes to extend its service upon another street it can not do so until it has secured an additional right. Why should these old telephone companies have more right than the new ones or any other public utility? It is true we cannot deprive these companies of what they have already acquired, neither do I think any municipality would seek to work this hardship upon the telephone company, but I feel if they wish to make any further extensions they should do the same as the street car company, get a franchise.

To this end bills were introduced in the last legislature. The senate at its last session passed the following bill with only one dissenting vote, but owing to it being introduced late in the session and the members of the house not being thoroughly familiar with this measure, it failed to come to a vote in the house. The bill that passed the senate reads as follows:

"A Bill. For an act to amend Section Twenty-one Hundred and Fifty-eight (2158), Chapter Eight (8), Title Ten (10), of the Code referring to Telegraph and Telephone Lines.

"Be it enacted by the general assembly of the state of Iowa:

"Section 1. That section twenty-one hundred and fifty-eight (2158) of the code be and the same is hereby amended by striking out the 'period' (.) in the fifth line and inserting a 'comma' (,) in lieu thereof and adding the

following: 'but no person, firm or corporation owning or operating a telephone system within the limit of any incorporated city or town within the state, not having a franchise legally granted by such city or town in which it is transacting business, shall be permitted to extend its lines, poles, wires, conduit or place any additional telephones until such person, firm or corporation shall have been legally granted a franchise authorizing and permitting it to make extension.'

"Section 2. This act, being deemed of immediate importance shall take effect and be in force from and after its publication in the Register and Leader, and the Des Moines Daily Capital, newspapers published at Des Moines, Iowa."

You will note that this bill is very just. It does not in any manner take away any of the privileges of the companies affected by this bill further than to compel them to get a franchise if they wish to extend their service, the same as a street railway, gas, water or electric light company would be compelled to do.

In looking over the report of the sixth annual assessment of telegraph and telephone property in the state of Iowa, we find some very interesting comparisons in the figures of table No. 4, which reports on mixed commercial telephone companies, including exchanges, farm and toll telephones. The report shows that 260 telephone companies are assessed less than \$50 per mile, 32 companies over \$50 and less than \$100, 12 over \$100 and less than \$200, 5 over \$300 and less than \$500, 3 over \$500 and less than \$1,000, 1 over \$1,000 per mile. It is interesting to know the different rates as they are so far apart; for instance, the Tingley Telephone company, of Ringgold county, has one and three-fourths miles and is assessed at \$1,800 per mile, while the Olds Telephone Company, of Henry and Washington counties, has 7½ miles and is assessed at \$1.40 per mile. The Chariton Telephone Company, in Lucas county, has 21 miles and is assessed at \$599.05; Eldora Mutual Telephone Company, in Hardin county, has 5 miles and is assessed at \$575 per mile. The Iowa Telephone Company, better known as the Bell, is assessed at \$60.25 per mile. In order to give you a more direct comparison I will refer you to Polk county, of which Des Moines is the county seat. The Iowa Telephone Company has 181 miles and is assessed at \$60.25 per mile, making the assessment for Polk county \$10,927.54, while the Mutual Telephone Company, in the same county, has only 104 miles and is assessed at \$384.60 per mile, making the total assessment of \$39,998.40, which is nearly four times the amount assessed the Iowa Telephone Company. In fact, the assessment of the Mutual, of this city, equals over nine and one-half per cent of the total assessment of the Iowa in the whole state, with its 6,326 and one-half miles of service. In other words, the Mutual Telephone Company is assessed for this county \$29,070.86 more than the Iowa Telephone Company, yet the Iowa Telephone Company has 77 more miles of service than the Mutual Company.

I believe that there should be, not only a strong effort to secure some legislation by the next general assembly regulating the telephone companies, putting them all on the same basis, thereby dealing justice to all and removing the only perpetual franchise that works a hardship upon municipalities, but that the legislature should be asked to make an appropriation to aid this league in the maintenance of a bureau of information for the benefit of all Iowa cities and towns.

# Salesmanship Discipline in Good Old Missouri

By ONE OF THEM

While on a trip in south-eastern Missouri recently the writer had the pleasure of eight companions, all competitors.

Leaving St. Louis one hot afternoon we rode along past saw mills, swamps and razor backs to a small junction town, where was located a fair sized saw mill and some 15 or 20 houses.

Waiting some 20 or 30 minutes for a train to our destination we passed the time watching the young colored population scamper. We also had the pleasure of seeing a genuine Missourian coming down the road with a load of logs, with four yoke of oxen attached. Not being



Getting Acquainted with Some of the Gentler Sex.

familiar with this scene we immediately set our eyes upon it, because the writer was wondering as to how the driver would manage to draw up to the mill to unload. After a few minutes of time had passed our anxiety was allayed, the driver being evidently a past artist in team work as the work of bringing the load to the log pile was the easiest part of all.

Leaving this junction point on a mixed train of several freight cars and one passenger coach we (after passing several hamlets) arrived at our destination and inquired the way to a first class hotel, which happened to be the only one running in town. On arriving at the hotel we were greeted by a genial Missourian, Uncle Dudley, who kept a very clean as well as orderly place. Registering our names we were each assigned to the various rooms, and made preparation for supper.

Several of the writer's competitor-friends arrived a day or two ahead of time, either to get acquainted with the directors of the newly organized telephone company or lease land for the purpose of boring for oil, but nevertheless they were more or less successful in getting acquainted with some of the gentler sex, which helped pass away the long evening hours.

The landlord and his wife believed in running their hotel on a system which was very hard to break away from. You could leave your call for 6:45, but about 6:15

you would have a summons: "Better all git up and have breakfast together."

There being no electric lights in town they of course still stuck to J. Rockefeller's product, and every evening when you would retire to your room, unless you made haste to estinguish your lamp, a call would be made for "all lamps out." One evening one of the boys happened to be a little late in retiring and had to arouse the landlord in order to gain admittance. He was greeted cheerfully at the door, but on ascending the stairway discovered that the landlord was also on the way. Arriving at the door of his bedroom he was informed that all lights had been ordered out and to make haste. All of these orders were obeyed to the letter, owing to several happenings on the first day of arrival.

Sitting in the office, hoping the order would be placed with the firm the salesman represented, the salesman, through oversight, expectorated on the floor. Immediately the landlord presented him with a cuspidor with information as to its use. In reply to the landlord the salesman stated he intended to expectorate on the ceiling until the cuspidor was found. The landlord was equal to the occasion by stating "I reckon there will be trouble brewing if such a thing happens." Immediately afterward it was noted that the landlord was the proud possessor of a 45-90 repeater, which he started polishing,



"You'd Better All Git Up."

and talking to it as follows: "It has been quite a while since I used you, but I reckon I will have to bring you into use soon."

It is an assured fact that a better disciplined lot of telephone salesmen was never gathered at a like meeting.

The rules of the house were strict but were gladly obeyed, very likely on account of the strong and robust looking landlord.



The boys were not allowed to talk to a customer in the dining room, as the landlady informed you she was waiting for a chance to eat. One of the salesmen felt so good over the prospects of getting the order for telephones that he started to arouse the rest by singing at the supper table. He was cut short by a command that no singing was allowed, but that he could sing outside. There was no card playing or profanity allowed on the premises; no weekly boarders; no chance of getting any discount from the rates. In fact, everything was net, on delivery.

In conclusion will say that the trip was one never to be forgotten by the jolly nine and hope to meet Uncle Dudley and his good wife at the union depot some time.

### **The Right of Eminent Domain.**

The question of whether or not a telephone company incorporated under the laws of another state can exercise the right of eminent domain in Tennessee will come before the supreme court of that state at the December term from Williamson county. An order from Judge M. M. Neil, of the supreme court, was received recently by J. J. Roach, clerk, in the case of William Hume vs. the Long Distance Telephone & Telegraph Company.

The application of Hume for a writ of supersedeas to stop the execution of the order of condemnation of the circuit court of Williamson county in the condemnation proceedings pending an appeal to the supreme court and an adjudication there of the questions involved is denied, but the court granted a writ of certiorari which will bring the case to the supreme court on the whole record.

In this case the telephone company, which is an Alabama corporation and is seeking to erect a long distance telephone line throughout Tennessee and into Kentucky, instituted condemnation proceedings in the circuit court of Williamson county against certain property of William Hume. The condemnation was ordered and damages assessed by a jury of review. Thereupon Hume filed an application for writs of supersedeas and certiorari to prevent the company from entering upon the lands and erecting the poles and wires until the case had been passed on by the higher court.

By refusing the writ of supersedeas the company can proceed to enter upon and erect its poles and wires on the lands condemned, but should on the appeal of the supreme court the action of the circuit court be reversed then the court could require the poles and wires to be removed. Although no opinion was filed with the papers and there was no intimation that the court had taken any position on the very important question of condemnation under the right of eminent domain, the court's action in refusing to grant the writ of supersedeas might be inferred as an indication that this question would be finally decided in favor of the telephone company.

At any rate the question of exercising the right of eminent domain by a foreign telephone company, about which there is a difference of opinion among lawyers, will come before the court at the ensuing term for adjudication. So far as known the Tennessee supreme court has never directly passed on this question.

### **Built First Telephone in West.**

J. R. Whitney, of Carroll, Iowa, claims to be one of the first telephone line builders in the west. While attending the Iowa republican state convention at Des Moines recently, Mr. Whitney told of his pioneer work in the telephone business. "I remember well the first

telephone line built in the west, for I helped to construct it," said he. "It was about a mile and a half long and ran from my father's grain office to the depot and was used for transmitting telegraph messages and keeping track of delivery wagons. It was a novelty in the country. We lived at that time in northern Illinois, west of Chicago. That mile and a half telephone line was built before they had telephones in the city of Chicago.

"Marvin Hughitt, now president of the Northwestern railroad, was going through our town and his train stopped there to meet another, for the double track road was not then known in the west. Some one told him about this telephone line and he went into the telegraph office at the depot and called us up on it and talked over it.

"We ordered the telephone from the makers, after seeing it explained in the Scientific American. With it came the directions in ink in handwriting, not printed. We were asked for a testimonial later as to the success of the machine. Think of a testimonial to the excellence of a telephone.

"My brother and I built the line while our father was out of the town and when he returned he declared it was nonsense to talk about being able to talk over it. But he soon was convinced. My brother and I proceeded to collect tolls from him for using it thereafter in his business, so I regard myself as one of the original proprietors of a telephone line in the west."

### **The Bell at Its Old Game.**

The Overbrook (Kas.) Citizen accuses the Missouri & Kansas Telephone Company, commonly known as the Bell Company, of attempting to crowd out the Independent system there. The telephones in and about Overbrook are worked from an Independent central at Overbrook. This central connects directly by a long distance wire of the Topeka Independent company with the Topeka telephone system. Recently the Bell Company sent a representative to Overbrook who attempted to buy out the central there. Being unsuccessful in this he proposed to establish a Bell central at Overbrook with a small monthly fee for switching and a light charge for making toll connections with Topeka. The Citizen accused the Bell Company of attempting to crowd out the present system in order to have absolute control of the situation there. Of course, the Bell officials deny that there is any such intention, but they are not fooling the wide awake people of Kansas.

### **Tri-State Is a Great Company.**

The Tri-State Telephone and Telegraph Company, Minneapolis, Minn., is one of the most prosperous and progressive Independent companies in the west. It maintains three exchanges in Minneapolis, besides main, and two in St. Paul, besides main. It also owns 2,500 miles of copper lines and 30 exchanges, besides connecting with an extensive system in North Dakota. The service was started in 1901, and the number of instruments now in use is 25,000. The company is capitalized at \$6,000,000. Its rates for business service are \$48 per year and for residence service \$30 per year. The affairs of the company are managed by E. H. Moulton, one of the most expert and efficient telephone men in the United States, and L. L. C. Brooks.

# Pacific Coast Telephone Enterprise

Much interest has been manifested among telephone men and the public at large in the plans of the great Pacific coast combination of telephone companies which propose to cover Oregon and Washington with a modern system. The new organization consists of four companies—Home Telephone Company of Portland, Oregon; Home Telephone Company of Puget Sound; Home Telephone Company of Spokane, Wash.; and Northwestern Long Distance Company. A brief statement of what these "Home" companies intend to do is embodied in the following paragraphs.

The Home Telephone Company of Portland is incorporated under the laws of the state of Oregon and has entered into a contract with the Empire Electric Company of Toledo, Ohio, for the initial construction in Portland of a system with 8,000 telephones installed and in use. The active work on this construction was begun in September, 1905, and the company will begin giving service about December 1, although the full number of telephones will probably not be in complete operation until about March 1. Already over 8,000 subscribers have been secured and it is expected that fully 15,000 telephones will be connected as rapidly as the instruments can be installed. The franchise at Portland was granted by a popular vote at a special election and was passed by about 15 to 1. The system is entirely conduit and cable. The work on the conduit was finished September 1, and is calculated to take care of 35,000 telephone lines. There are three exchange buildings at Portland, erected by the company for their exclusive use. The main exchange is a modern, fire-proof structure costing about \$75,000. The equipment of this company will be entirely automatic. The Home Company has a force of solicitors at work in the city, and contracts for phones are coming in at the rate of four to five hundred per week. The Portland Company is capitalized at \$3,000,000, with the purpose of building as a part of the Portland Company outside systems throughout the state. Already a plant at Albany has been completed under this plan and the public are delighted with the automatic service as compared with the service given by the Bell Company.

The Puget Sound Company comprises in the initial contract with the Puget Sound Telephone Construction Company the cities of Tacoma and Bellingham in the state of Washington; but, as in the case of Portland, it is expected to take in the outside territory, particularly that part of the state lying between the Cascade mountains and the Pacific ocean and tributary to Puget sound.

The Puget Sound Company is to have 6,250 telephones installed and in use under the initial contract and the indications are that not less than 10,000 phones will be in service there within a year. As in Portland, this plant is an entirely conduit and cable system, with automatic equipment. The present capacity for the system will be 20,000 phones. The main exchange in Tacoma is a re-enforced concrete building costing about \$80,000, exclusive of equipment, and will be the most modern and complete that money and expert knowledge of telephony can devise.

The Home Telephone Company of Spokane, under the initial contract with the Empire Electric Company, will include the cities of Spokane and Walla Walla and will call for the installation of 6,000 telephones with an all

cable and conduit system and automatic equipment. Only preliminary work has been done at these points, but materials are fast being assembled and gotten into condition for very rapid construction. This system will be given service about August or September of next year. Everyone in these cities is welcoming the advent of the "Home" service and the success of the different companies is already assured.

The Northwestern Long Distance Telephone Company has been incorporated with a capital of \$1,500,000 and a bond issue of \$500,000. The plans of the company are for a system that eventually will extend from the state line of California and Oregon on the south to Vancouver on the north and to Spokane on the east and Puget sound on the west, connecting the Independent telephone companies of the two states. Construction was commenced last July on the line between Tacoma and Seattle and will be extended as quickly as possible to Portland. No expense is being spared by the different companies to make these plants the finest in the country and they are being pronounced such by every telephone man who has inspected them. The sale of their securities at par, with a 50 per cent. stock bonus, is meeting with unusual success.

Local men of prominence in business affairs will be placed on the directorate of the various companies as soon as completed and taken control of by the various telephone companies.

The National Securities Company, Los Angeles, Cal., are the underwriters and owners of the bond issues of the four companies.

## Bell Left Behind in Ithaca.

The Ithaca Telephone Company, Ithaca, N. Y., is making great inroads into the business of the Bell Company in Tompkins county. In less than one year the Independents have doubled their list of subscribers in the county and gained about 500 in the city. Until the last of January the Bell Company had the whole northwestern part of the county covered under cast-iron contracts, but now the Independents have bought control of this promising territory. This gives the Ithaca company about 3,500 'phones in Tompkins county against 1,600 Bell 'phones. A new ten-position switchboard has recently been installed and a wire chief's room, battery room, store room and a manager's office added. Independent companies are springing up all over New York state, a large one having just been organized in Tioga county. The Ithaca company's business is managed by Mr. R. B. Fegan.

## This Happened in Arkansas

The Everbest Magazine, the clever little house organ of the Ewing-Merkle Electric Company, St. Louis, tells this story of a man in Arkansas who discovered that his telephone did not work properly and proceeded to take the transmitter apart to repair it. He lost the granulated carbon out of the cup and after examining it decided that it was gunpowder. He forthwith proceeded to refill it from a can he had in stock. The first time the hook was raised the current from the battery ignited the gunpowder and the coroner was at once notified.

# Talks and Queries

## A Correction.

Mr. Nicholas writes us that he thinks that there has been a mistake in diagram No. 9 of Mr. Kelsey's article on induction coils. There was a mistake made and the diagram should have been as Mr. Nicholas suggests. The diagram is shown as follows:

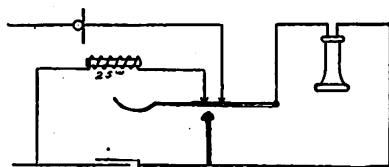


FIG 9

EDITOR SOUND WAVES:—Can you tell me what is the matter with our rural line? It talks all right and rings all right most of the time, but it gets spells when we cannot ring. At these times the talking is perfect. All the bells refuse to ring at the same time. If it were not for the fact that we can talk all right I would say that the line was grounded. The line is the ordinary grounded circuit.

The trouble that you experience is probably that of a partial ground. There is a slight leak somewhere which does not interfere with the talking and does not hurt the ringing all the time. This kind of trouble occurs now and then, just often enough to bother one a great deal. It is the kind that seems to be present when your back is turned and which disappears when the test is made. Lightning arrestors usually are responsible for such trouble. The carbon blocks are so close together that when the lightning discharges there is a projection raised which very nearly causes a short circuit. The talking current will pass by such a place without trouble but the ringing current, having a high voltage, will sometimes jump at this point and cause the trouble. If the affected arrestor is at one end of the line and the party ringing at the other end, the signals can be given without trouble, but when a telephone near at hand is used there is trouble. The current from the distant telephone is reduced a great deal in voltage before reaching the affected arrestor and so there is no trouble, but the telephone that is close sends its current undiminished to this point and it jumps immediately. Then again, sometimes there is a case where the arrestor is actually grounded through this little protuberance, but through quite a high resistance. The ringing current in passing through will heat the point of contact and burn it off, and then there is no more trouble for a few days till the point is again grounded. Your best plan will be to go over the entire line and carefully clean all arrestors.

In connection with this it might be well to relate a case of trouble which once occurred and which may be your trouble. An inspector was troubled with a line that always seemed to be grounded in the morning and during rainy weather. One could talk at all times, but not so well during the time that the line rang grounded. After carefully going over every inch of the wire it was found that the wires at one place passed over a large factory building. Workmen on the roof of this building had twisted the wires together for a distance of about twenty-five feet and tied them back out of the way. The wires were very rusty and so did not cross except when

wet. The dew in the morning and the rain caused sufficient short circuiting to prevent the ringing of the bell.

At another time there was a short on the line only at night and it cleared every morning about the same time. It was found that at night when the weather was cool, the line wire contracted and pulled up against a guy wire. In the morning when the sun shone upon the line, it again expanded and cleared itself.

EDITOR SOUND WAVES:—Will you please answer in your columns whether it would be practicable to change a small rural exchange of a dozen lines part metallic and part grounded to the selective ringing system? Would it be possible to make the change and still use a magneto call and the alternating hand generator at the switchboard?

For the number of lines that you have, we should say that it would hardly pay to make the change. It may be that the local conditions are such as to demand the change and in such case the best plan might not be that which looks to you like the best business practice. It would not be practicable for you to try the complete selective system unless your subscription rates are sufficient to warrant the extra expenditure for construction. To be able to ring selectively there must not be more than four telephones on each line and each line must be metallic. The partial selective plan may be used to advantage sometimes. By this plan you would have more than four to each line. Suppose that you had twelve on a line. Then you would have one, two and three rings for each of the possible selections. This would simplify the signaling and do away with the multitude of signals. The switchboard generator for such a system must be capable of giving a positive and a negative pulsating current and there must be a special key on the board for throwing the different kinds of current upon the ringing keys. Your subscribers would not be able to call each other but when a party wished to talk to another on the same line he would have to call up the switchboard and have the operator do the ringing. This would make more work for the operator and unless you have all night service it might cause dissatisfaction among the subscribers.

EDITOR SOUND WAVES:—What do I need to test dry cell batteries such as are used for ringing current on a switchboard? A volt-meter or an ammeter?

You can use either a voltmeter or an ammeter for the testing of your batteries. When the ammeter is used a test is made with the ammeter connected directly across the terminals of the cell, that is, with the cell short circuited. By comparing the current given with that of a new cell you will know whether it has the proper output. A new cell will hold its current for a few moments and then the current will gradually die away while the current from a defective cell will drop away immediately and will not register much even at the start.

In testing with the voltmeter, it is best to make the test while the current is flowing for after a rest a bad cell may show a pretty good voltage. A new cell has a voltage of about 1.5 and even on a closed circuit with the regular service current flowing the voltage will not

fall much. You can buy a cheap battery gauge for not more than four or five dollars from any of the telephone factories, which will give you very good service.

EDITOR SOUND WAVES:—I have trunks connecting this town with another about two miles away. The trunks are copper metallic and when in good condition are absolutely quiet. One of these trunks is so noisy one can hardly hear himself think when trying to talk. It is not grounded for it tests all right. I can ring the drop down all right and can talk, but not very strong, probably because of the great noise. Can you help me?

Did it ever occur to you that you can talk and ring over a line that is open under certain circumstances? Your line is very likely open. It has quite a little static capacity and in ringing over it and talking you are merely doing the same thing that you do every day when you ring and talk through a condenser. The line being open is unbalanced, hence the noise.

EDITOR SOUND WAVES:—I would like to have you tell me what has gone wrong with my telephone. When I take down the receiver to listen in on the line I hear a hissing noise which sometimes changes to a whistling or singing sound. This is very annoying as I cannot hear very well.

This sound is caused by the transmitter. Either you have too many cells of battery connected with it or it needs to be repaired. The noise is caused by a very small arc which is formed between two particles of carbon or between a particle of carbon and one of the electrodes. This arc is of course very small, but because of the sensitiveness of the instrument it is heard perfectly. The sound is very similar to that which is given by the arc of an ordinary electric street lamp and is in truth exactly the same thing on a smaller scale.

EDITOR SOUND WAVES:—Will you please tell me how to make a good finish for rubbing up the cabinets of my telephones. They are getting shabby and if cleaned they would again look like new.

A good finish is made from taking equal parts of turpentine and linseed oil and mixing them thoroughly. Apply with a soft cloth and then rub till the cabinet is thoroughly dry. Any surplus of the finish will collect dirt and cause the telephone to look bad soon. There are other very good finishes that will give you very good results. Your furniture dealer always has such finishes on hand for touching up his display and he can sell you all you want if you do not care to make it yourself.

EDITOR SOUND WAVES:—I want to tell you a peculiar case of trouble that we solved last week after it had kept us busy for several weeks. We have a toll line running about twenty miles into the country which became completely grounded without any warning. The line is a grounded circuit and is the source of quite a considerable income to the exchange. Naturally we were in a hurry to fix it. After going over every foot of the line and not seeing anything wrong, we decided to start out and cut the line in the middle and test each way. When we cut the line we found that both halves were still grounded. So we took each half and cut them in half and found that each quarter was grounded. We kept on testing till finally one of the linemen found upon climbing a pole a very fine insulated magnet wire carefully hidden away in a crack of the pole. We then traced this wire and discovered that one end was grounded and the other attached to the line. Every half mile of the line was thus grounded and the ground wires carefully hidden in the cracks of the poles. The wire had evidently been taken from an old ringer movement. It was No. 36 gauge. We have found that the work was done by a lineman that we had discharged for loafing on his job. It has struck me that

if he had spent as much time in trying to do good work for the company as he did in doing a skilled job of grounding the line, he would be one of our star employees. He is now taking sixty days, (enforced) rest.

It is unfortunate that there are such people in this world, but it seems that they are here and that we have to get along as best we can. Such a revenge was certainly the product of an active brain. Most men in his position would have taken the easier plan of punching holes in the sheathing of your cable, and would have caused you a greater amount of trouble and damage.

EDITOR SOUND WAVES:—I wish you would give me some advice regarding my cable. A short time ago we got a lot of cable from a reputable manufacturer and now the sheathing is all cracking and the cable is about worthless, for if I were to mend it the cable would resemble a string of beads, the sleeves would be so close together.

What I want to know is, can we hold the company that made the cable responsible for this? The cable is certainly defective and they should make it good. We have paid for the cable or we would withhold payment.

The company, whose name you give, is certainly responsible and if the cable was not properly made they would be the first to wish to make good your loss. But we do not think that they are at fault. They have been making cable for many years and the chances are a thousand to one that the cable is all right.

You have a considerable amount of high winds in your part of the country. Your suspension wire is not strung very tightly. The result is that the wind sways the cable back and forth till the lead of the sheath crystallizes and the cracks start.

In running a line of poles for cable, be sure that they are all very stalky and well guyed. Use no messenger wire smaller than  $\frac{3}{8}$  inch and use this size only for smaller than 50 pair cable. Larger sizes to 100 pair require  $\frac{1}{2}$  inch strand. Pull this up so tight that when the cable is on there will not be more than six inches sag in a hundred foot span. Then, if your guys are tight, the wind will have very little effect on the cable. You are not the first one who has found his cable sheath cracked.

When cable is run down a hillside for a considerable distance there will be trouble from cracked sheathing sometimes, caused by the creeping of the cable. There is such a tension on certain parts that considerably sized holes will open. In such cases the cable should be anchored at every third or fourth span, so that the stress is transferred to the messenger wire.

EDITOR SOUND WAVES:—I note in your issue of October, under the head of "Talks and Queries," some one asks if there is any law or decision of courts as to telephone companies taking care of their wire on public highways against damage by house movers.

I wish to state that a decision was handed down by the supreme court of North Dakota, in the case of the North-Western Telephone Co., to recover damages from E. B. Anderson, a building mover of Grand Forks, who caused injury to the company's wires by cutting them, to make way for a large hotel, which the city authorities had given him permission to move through the streets. The North-Western Telephone Company was awarded \$268.70 as damages. The case was decided February 19, 1904.

The use of a street for the moving of houses, said Judge Morgan, who wrote the opinion, is an extraordinary use thereof. Such use may be permitted, but cannot be legally done in destruction or impairment of vested rights. The case in point has been of very great assistance to the writer in two cases the past year, taking the legal ground that a city has no right to grant the use of the same space to two or more parties. The



writer will take issue with the editor, so far as it is his opinion that it is the duty of the company to allow movers to pass. Cut the wires, this is all right when the cutting does not entail more than a few dollars, but where it amounts to hundreds of dollars the writer believes in taking a legal stand and find out where we stand in the premises.

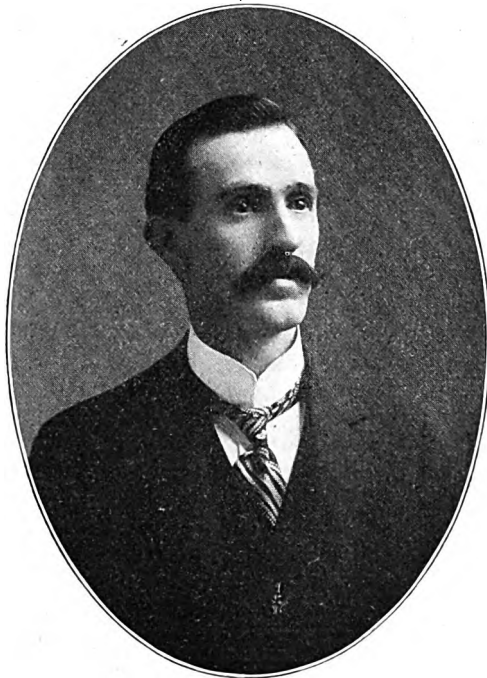
There has been too much of that submissiveness on the part of the Independent telephone companies, and there is where some of our profits have gone. The writer had a case in point this summer where a house mover called up and requested me to move cable and wires so as to let him through with his house, or he would cut them down. I notified him to pay damages or pull down his house, and he agreed to pay.

I hope this will assist your inquirer to make the house mover pay all damages.

G. H. GLASS.

### STRONG KENTUCKY ORGANIZATION.

The newly-organized Independent Telephone Association of the Fourth Kentucky district is already making its influence felt in the section of the state where its members reside. A great deal of work has already been done, and more is under way. The Central Home Telephone Company has built copper toll lines from Henderson to Hopkinsville, via Madisonville, with a toll exchange at the latter place; also lines from Madisonville



W. G. TURPIN,

Secretary Fourth Kentucky District Independent Association

to Paducah, via Marion, Providence and Smithland, and from Bowling Green to Russellville. Lines are also being constructed from Russellville to Paducah, via Hopkinsville, and exchanges are under construction at Russellville and Elkton, the one at Mayfield being already completed.

The Henderson T. and T. Company is preparing to rebuild and enlarge its system. At the annual meeting of the company, held recently, the following directors were elected: R. T. Hickman, William Elliott, David Banks, H. K. Cole, J. Reichert, B. G. Witt and W. G. Turpin. The executive officers are: R. T. Hickman, president; Wm. Elliott, vice president; David Banks, treasurer; W. G. Turpin, secretary.

The recent meeting of Fourth District Association, reference to which was had in the October issue of SOUND

WAVES, elected F. G. Hoge, of Hopkinsville, president, and W. G. Turpin, of Henderson, secretary and treasurer. At the meeting the following companies were represented:

L. N. Burk, Owensboro, Rural Home Tel. Co.; J. W. Carter, Owensboro, Kentucky and Indiana Tel. Co.; H. K. Cole, Owensboro, Owensboro Home Tel. Co.; R. T. Hickman and W. G. Turpin, Henderson, Henderson T. and T. Co.; W. B. Butler, Marion, Marion Home Tel. Co.; L. N. Burk, Owensboro, Rough River Tel. Co.; J. E. Bergin and H. J. Jeffrey, Paducah, Paducah Home Tel. Co.; J. C. Ramage, Providence, Providence Home Tel. Co.; F. G. Hoge, Hopkinsville, Todd County Tel. Co.; J. C. Monteith, Birmingham, Ala., and M. B. Overly, Louisville, Central Home Tel. Co.; H. J. Jeffrey, Paducah, Marshall County Tel. Co.; R. A. McCurdy, Mayfield, Mayfield Home Tel. Co.

President Hoge appointed the following committeemen to have charge of the work of the association in the various counties comprising the district:

Robert Fisk, Benton, Marshall and Calloway counties; J. D. Kennedy, Fulton, Fulton county; Mark Bynum, Moscow, Hickman county; H. J. Jeffrey, Paducah, McCracken, Carlisle and Ballard counties; R. A. McCurdy, Mayfield, Graves county; M. H. Story, Salem, Livingston county; W. B. Butler, Marion, Crittendon and Lyon counties; R. T. Durrett, Hopkinsville, Christian and Trigg counties; J. C. Ramage, Providence, Webster, Hopkins and Caldwell counties; Dr. H. E. Whitlege, Uniontown, Union county; W. G. Turpin, Henderson, Henderson county; H. K. Cole, Owensboro, Davis and Hancock counties; L. N. Burk, Owensboro, McLean, Ohio and Muhlenburg counties; W. I. Allison, Bowling Green, Butler and Warren counties; Harry Smith, Russellville, Logan and Simpson counties; H. C. Hynes, Guthrie, Todd county; W. F. Pardue, Scottsville, Allen county.

### Bookkeeping by Telephone.

Recent comments on the use of private telephones by municipal officers in Greater New York has brought out the fact that although critically ill and unable to leave his bed for days at a time, William Chambers, of Brooklyn, general bookkeeper of the Brooklyn borough administration, has for three months carried on a large part of his duties and looked after the borough's finances by use of a telephone. When he was too weak to be driven to his office Public Works Commissioner Dunne asked permission to put a telephone in Mr. Chambers' house, so the latter could be consulted on important matters. His physician objected, but Mr. Chambers consented, and for the last three months heads of departments and bookkeepers have called him by telephone several times a day for instructions and information. He carried all the important business in his head.

### An Order for the Public Good.

The Grand Order of Anti-Telephone Monopoly is the pretentious name of an organization of Denver (Col.) citizens. The order will meet November 6, to vote on the city's new telephone franchise. The officers have decided to confer a special honorary degree on all members who have ever dropped two nickels to get one call or have a kick coming against the Bell monopoly. The sign of recognition of the order is to make a noise like the dropping of a nickel in the slot.

# Recent Telephone Patents

An improved telephone system has been invented by David H. Wilson, of Chicago, Ill., and he has assigned the same to Robert Bines, of the same place. The number of his patent is 830,271, and it is dated Sept. 4, 1906.

This invention relates to telephone systems, and has for its object to provide a new and improved system of this description.

It consists of a transmitter-circuit and a line-circuit, a portion of each of said circuits being wound about a

cores interposed between said first-mentioned cores, each provided with a coil, and a receiver connected in circuit with both of said coils, the several cores magnetically insulated from each other.

John Z. Miller, of Erie, Pa., has obtained letters patent of the United States, No. 830,161, dated Sept. 4, 1906, for an improved telephone.

This invention relates to telephone systems. More particularly, the invention relates to a selective system—that is, a system wherein two parties may be connected with one metallic circuit and call the exchange or be called without calling the other party on said line.

It consists of two telephones connected with said line-wires, said line-wires forming a metallic circuit for said telephones, one of said telephones having its ringer bridged with an impedance-coil across the metallic circuit, the resistance of the impedance-coil being greater

Fig. 1

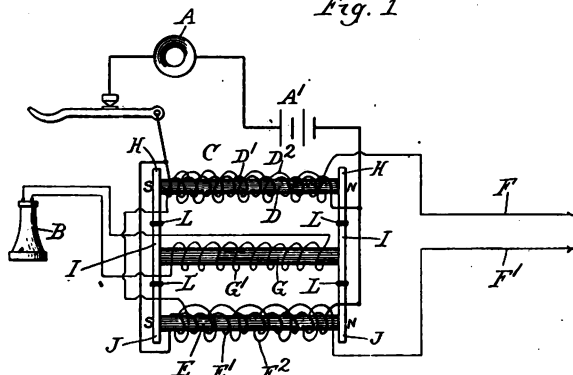
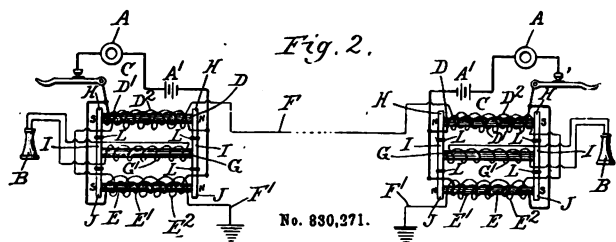


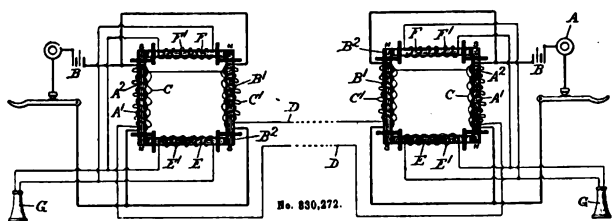
Fig. 2.



No. 830,271.

core, a receiver-circuit, a core therefor about which a portion of said circuit is wound, said latter core in proximity to the core about which a portion of the transmitter and line circuits are wound, but magnetically insulated therefrom.

David H. Wilson, of Chicago, Ill., has obtained letters patent of the United States, No. 830,272, dated Sept. 4,

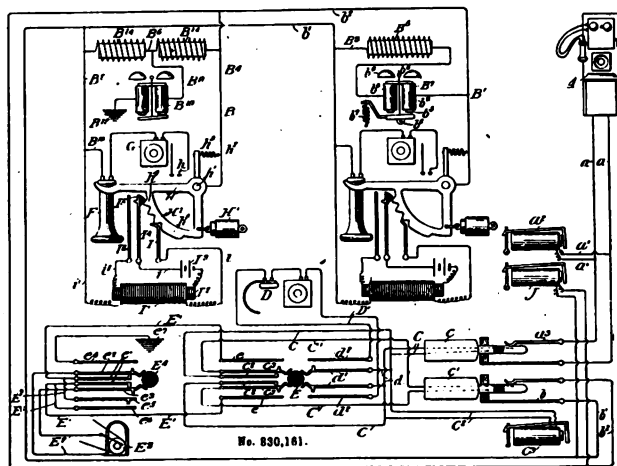


No. 830,272.

1906, and he has assigned the same to Robert Bines, of the same place. Telephone apparatus.

This invention relates to telephone apparatus, and has for its object to provide a new and improved apparatus of this description.

It consists of transmitter-circuit, two separated iron cores about which a portion of said transmitter-circuit is wound, a main line-circuit having a portion also wound about said cores, the windings being such that the opposed poles of said cores are unlike, two separated iron



No. 830,161.

than that of the coils of the ringer, and the other of said telephones having its ringer connected with both wires of the circuit and the ground; an exchange-generator; and switches for throwing the generator into the metallic circuit for actuating the ringer of the telephone having its ringer bridged across said circuit, and for throwing the generator into connection with both line-wires for one side of the circuit and through the ground for ringing the other of said telephones.

## South Bend Company Reorganized.

The South Bend Home Telephone Company, South Bend, Ind., which recently passed into the control of Joseph Harris, vice president of the Automatic Electric Company, and other Chicago interests, has been reorganized and the following officers elected: President, Theodore Thorward; first vice president, Horace G. Miller; second vice president, C. C. Wheeler; secretary, Elmer R. Stoel; treasurer, Sanford Harris. Within a short time a \$5,000,000 toll line company will be organized for the purpose of taking over the telephone business of the Illinois Tunnel Company, at Chicago, and building toll lines out of Chicago to connect with all Independent companies. South Bend will be the switching point for all business going east, north to Michigan and south to Indiana.

# Giant Independent Telephone Merger

What is unquestionably the most important merger of Independent telephone lines in the history of the country has just been perfected by the American Union Telephone Company, which has just taken over all of the property and rights of more than three-fourths of the strongest Independent companies in Pennsylvania, Southern New York, Northern Virginia, Maryland and West Virginia. At the same time by traffic agreements the new company acquired long-distance connections over one-third of the territory of the United States, including in more than one-half of the country's population.

The new combination, which is capitalized at \$25,000,000, will begin work immediately on extensions, connections and improvements to develop these separate companies into one complete local and long-distance system, which will be the most extensive Independent system in the country.

Heretofore none of the companies included in the merger, on account of restricted territory and limited capitalization, has been able to equip their lines effectively for long-distance service, but the reports made to the new company show that these constituent lines have been doing a toll business approximating \$200,000 per annum. All of these lines will now be equipped with the latest improved devices.

Long-distance business is to be the matter of first import in the developing of the combined property, resulting, of course, in the perfecting of all intermediate lines. A statement issued by the company shows that the toll business is increasing so rapidly that the capacity of the companies now handling this business is inadequate to give satisfactory service. Within four years the toll business of the country has increased more than 50 per cent.

While the American Union Company will immediately enter into competition with the Bell Company for the toll and long-distance business in this section there will be no reduction of rates, the advantage to be offered by the new company being the use of any line for five minutes at the same rate for which rivals now give a three minute service.

The American Union Telephone Company was incorporated under the laws of Pennsylvania May 31, 1906, and the time since then has been spent in perfecting the merger. The board of directors of the company includes a number of the wealthiest and most influential men in the sections covered by the new system and the bond issue of \$2,500,000 for immediate improvements has already been subscribed for.

The following companies are directly united by the consolidation:

United Telephone & Telegraph Company, operating from the Philadelphia county line northwest to the city of Williamsport and west to the city of Altoona, inclusive.

Cumberland Valley Telephone Company, extending from the city of Harrisburg southwest through the Cumberland valley to the state line and northwest to the borough of Lewistown.

Lykens Telephone & Telegraph Company, operating exchange centers at Elizabethville, Lykens, Millersburg and Tower City.

Cumberland Valley Telephone Company of Baltimore City, operating in the states of Maryland, Virginia and West Virginia.

Boydes & Damascus Telephone Company, embracing the county of Montgomery, Maryland, with principal exchanges at Boyds and Damascus.

Huntingdon & Clearfield Telephone Company, extending from Snow Shoe in Center county to Patton in Cambria county.

Cambria Telephone Company, embracing the county of Cambria.

Indiana Telephone Company, embracing the county of Indiana.

Bradford County Telephone Company, embracing the county of Bradford, Pennsylvania.

Port Allegany Telephone Company, embracing the counties of McKean and Potter.

Petroleum Telephone Company, embracing the counties of Crawford and Venango.

Commercial Union Telephone Company, embracing the counties of Elk and Jefferson.

Union Telephone Company of Erie, embracing the counties of Erie, Crawford, Mercer, Venango, Beaver, Warren, McKean and Potter, in the state of Pennsylvania, extending to the city of Olean inclusive, in the state of New York, and to the city of Youngstown in the state of Ohio.

York State Telephone Company, embracing principal exchange centers at Elmira, Binghamton and Owego in the state of New York.

Philadelphia, Pittsburg & Erie Telephone Company, embracing present and proposed long distance lines in 43 counties in the state of Pennsylvania.

The new company, through traffic agreements, has acquired long distance connections with the following:

Keystone Telephone Company, operating in the city of Philadelphia, and connecting with all important points in the state of New Jersey, including Camden, Trenton and Atlantic City.

Del-Marvia Telephone Company, operating in the city and vicinity of Wilmington, Del.

Maryland Telephone & Telegraph Company, operating in the city of Baltimore and surrounding territory.

Consolidated Telephone Companies of Pennsylvania, operating principally in the cities of Reading, Allentown, Easton, Bethlehem, Hazleton, Wilkes-Barre and Scranton.

Pittsburg & Allegheny Telephone Company, operating in the city of Pittsburg and surrounding territory, and affording connections with lines of the United States Telephone Company, fully covering the states of Ohio and Indiana.

United States Telephone Company and Cuyahoga Telephone Company, operating in all the principal cities and towns in Ohio and Indiana, including Cleveland, Dayton, Indianapolis, etc.

Inter-Ocean Telephone Company, affording connections by one route with important cities in the State of New York, including Buffalo, Rochester, Syracuse, etc.

Inter-Ocean Telephone Company by a second route, through the city of Elmira, N. Y., with all important cities of the state of New York, including Albany, Troy, etc.

Cumberland Telephone Company, operating in the

city of Cumberland, Md., affording connection with the city of Wheeling, in West Virginia, and other important Southern towns and cities.

The long distance connections have all been acquired through the medium of the Philadelphia, Pittsburg & Erie Telephone Company, which has been organized as a subsidiary of the American Union Company to handle this branch of the service. In addition to the companies with which traffic agreements have been made the P., P. & E. Company has acquired by long-term contracts the exclusive toll and toll wire privileges of the following companies:

United Telephone & Telegraph Company, Cumberland Valley Telephone Company, Lykens Telephone & Telegraph Company, Cumberland Valley Telephone Company of Baltimore City, Boyds & Damascus Telephone Company, Huntingdon & Clearfield Telephone Company, Cambria Telephone Company, Indiana Telephone Company, Bradford County Telephone Company, Port Allegany Telephone Company, Petroleum Telephone Company, Commercial Union Telephone Company, Union Telephone Company of Erie, York State Telephone Company. This insures to the P., P. & E. Company, at the very outset, a large and remunerative business.

The board of directors of the American Union Company is as follows:

P. M. Chandler, Philadelphia, Chandler Bros & Co., members of New York Stock Exchange; John W. Garland, Pittsburg, president Safety Armorite Conduit Company, president Industrial National Bank; W. B. Trask, Erie, vice president Marine National Bank, president Trask, Prescott & Co.; A. W. Lee, Clearfield, vice president Clearfield Trust Company; James Kerr, Clearfield, president Pennsylvania, Beech Creek and Eastern Coal & Coke Company; J. L. Spangler, Bellefonte, president Bellefonte Trust Company, president Brubaker Coal Company; William Kaul, St. Marys, banker and capitalist; Edward Bailey, Harrisburg, president Harrisburg Trust Company, president Harrisburg National Bank; Lyman L. Gilbert, Harrisburg, lawyer; George W. Reilly, Harrisburg, vice president Pennsylvania Surety Company, treasurer Harrisburg Trust Company; B. F. Myers, Harrisburg, proprietor Harrisburg Star-Independent; Rem-

brant Peale, New York City, president Peale, Peacock & Kerr, coal operators; Sloat Fassett, Elmirt, N. Y., vice president Second National Bank; Ellis L. Orvis, Bellefonte, presiding judge Forty-ninth Judicial district, president Hays Run Fire Brick Company; S. P. Light, vice president Lebanon County Trust Company; H. Prentiss Taylor, Pittsburg, banking house of H. P. Taylor & Co.

The financial statement of the new company follows:

#### CAPITALIZATION.

Preferred stock, 100,000 shares (par value \$100) .....	\$10,000,000
Common stock, 150,000 shares (par value \$100) .....	15,000,000
	<u>\$25,000,000</u>
Preferred stock issued .....	\$ 2,000,000
Common stock issued .....	2,000,000
Preferred stock in treasury .....	8,000,000
Common stock in treasury .....	13,000,000
	<u>\$25,000,000</u>

The preferred stock is entitled to 6 per cent. per annum. It is non-accumulative as to dividends. It is preferred as to assets and dividends in the event of a dissolution of the company.

#### EARNINGS.

Gross earnings .....	\$1,018,013 04
Operation, maintenance, taxes, insurance, etc. ....	<u>522,273 84</u>
Net earnings .....	\$ 495,739 20
Fixed charges .....	<u>369,281 48</u>
Surplus .....	\$ 126,457 72
	Number of telephones, 40,040.

#### BONDS.

Authorized indebtedness .....	\$25,000,000
Reserve to retire underlying bonds .....	\$ 6,000,000
Issued for betterments, extensions and improvements .....	2,500,000
Reserved for future additions, extensions and acquisitions .....	<u>16,500,000</u>
	<u>\$25,000,000</u>

The \$16,500,000 bonds reserved for additions, extensions, acquisitions, etc., can only be issued at 85 per cent. of the actual cost of said additions, extensions, acquisitions, etc., and when the net income of the company amounts to one and one-half times the interest charges on the total number of bonds outstanding and to be issued for said additions, extensions, acquisitions, etc.

The main offices of the merged companies are at 227 Walnut street, Harrisburg, Pa.

## Personal and Field Notes

### DOMINION OF CANADA.

AN EXCHANGE has been established at Norwoch, Ont., by the Burgessville Telephone Company.

THE ALBERTA GOVERNMENT has inaugurated its long-distance system by starting a line from Calgary to Banff.

AN AUTOMATIC SYSTEM is being installed at Saskatchewan by the Saskatchewan Telephone and Supply Company. The new board will be fitted for 500 subscribers.

THE MEDINA TELEPHONE COMPANY, St. Mary's, Ont., has just gone into business. W. J. Atkinson is president; John W. Stewart, secretary, and John Pool, treasurer.

UPON CONDITIONS to be determined between the company and the city the Bellechasse Telephone Company, of which Dr. T. F. Demers, of Levis, is president, has been granted permission to enter Quebec.

A. W. VENNING, MANAGER of the Belmont Co-Operative Telephone Association, Belmont, Ont., informs SOUND WAVES that his company has declined to enter into a very favorable sub-licensee contract with the Bell Company. Such devotion to Independent principle cannot be commended too highly.

GENERAL MANAGER F. D. MACKAY, of the Canadian Machine Telephone Company, Toronto, which now operates exchanges at Peterboro and Brantford, has secured a franchise for his company at Lindsay, Ont.

THE RECENT CONSOLIDATION of the two rival telephone companies of New Brunswick is resented by thousands of citizens of that province and a movement is being organized in several places urging the people to demand of parliament, at its next session, the passage of a federal ownership telephone law.

GREAT PROGRESS IS REPORTED by the Stark Telephone, Light and Power System, Toronto, Ont., which has recently purchased the electric lighting plants in Oshawa and Bowmanville and is preparing to operate them under the Stark patents which combine telephone, light and power over one circuit. The company is also about to extend its telephone and lighting services northward from Toronto Junction to Woodbridge, giving the farmers service on the way.

GEORGE E. HYMERS, manager of the Hymers Telephone Company, Hymers, Ont., reports that arrangements for the installation of a long-distance service between Port Arthur and



Silver Mountain, a distance of 40 miles, with central at Hymers, are completed and work of construction is under way.

SINCE THE PASSAGE of the act bringing the telephone companies under the control of the Dominion Railway Commission 300 applications for approval of new lines, extensions, etc., have been disposed of by the Commission and many more are at hand, which indicates a great expansion of the telephone business all over the country.

TROUBLE IS BREWING between the Nova Scotia and Cumberland Telephone companies, at Amherst, N. S., because the Nova Scotia company contemplates a merger with the New Brunswick Telephone Company. A consolidation would deprive the Cumberland, which is a strong local company, of long-distance connection with New Brunswick, now made under a ten-year contract with the Central Telephone Company, which has lately been absorbed by the New Brunswick Company..

#### EASTERN STATES.

THE CONSOLIDATED TELEPHONE COMPANY, Allentown, Pa., has been granted a franchise in Womelsdorf, Pa.

THE BOARD OF ALDERMEN of the city of Rutland, Vt., has granted to the Home Telephone Company, Albany, a franchise to operate a plant at Rutland.

DR. I. L. PETERS is the secretary and manager of the new Kutztown Rural T. and T. Co., Kutztown, Pa., which is co-operating with the Consolidated of Pennsylvania.

AT OSWEGO, N. Y., F. A. Gage, M. M. Pauly and N. L. Whitaker, of Fulton, have incorporated the Oswego County Independent Telephone Company, with an authorized capital of \$100,000.

THE CORPORATION COUNSEL has advised the Board of Estimate and Apportionment of New York that the city has the right of regulating and prescribing rates to be charged by telephone and other public service companies seeking a franchise.

AT PULASKI, N. Y., the Black River Independent Telephone Company has just won an interesting suit against one Philetus Reynolds. A telephone was placed by the company in a house at Sandy Pond. Reynolds claimed that the wires crossed his property and cut them down. He had to pay for the damages sustained by the company, has given it a regular right of way over his property and paid all the costs of the action.

#### CENTRAL STATES.

THE EMPIRE TELEPHONE COMPANY, Bradford, Ill., has increased its capital stock from \$20,000 to \$35,000.

AT HAVERHILL, O., the Haverhill Telephone Company has been incorporated by prominent local men, with a capital of \$2,500.

THE STOCKHOLDERS of the Marseilles Telephone Company, Marseilles, Ill., have increased the company's capital stock from \$4,000 to \$12,000.

THE HOME TELEPHONE COMPANY has been organized at St. Jacobs, Ill., by Chris. Busse, Frank Virgin and John L. Noll. Capital \$5,000.

THE GREEN RIVER TELEPHONE COMPANY has been organized at Harmon, Ill., by Elmer Cotton and others, with a capital of \$2,000.

THE EXCHANGE TELEPHONE COMPANY, with a capital stock of \$25,000, has been incorporated by B. F. Wyman and other residents of DeKalb, Ill.

THE INDIAN CAMP COMPANY is the name of a new organization at Hopewell, O., which was incorporated by W. T. Craig and others, with a capital of \$3,000.

AT HAMMOND, ILL., the Hammond Mutual Telephone Company has been organized by Frank P. Smith and other citizens, with an authorized capital of \$5,000.

THE VALLEY TELEPHONE COMPANY, Lebanon, O., is installing a new switchboard and new telephones at a cost of \$50,000. The work is in charge of Manager Frank Binkley.

ONE OF THE PROGRESSIVE OHIO local organizations is the Preble County Telephone Company, West Alexandria, O., which now has over 500 instruments in use, with branch exchanges at Gratis and West Elkton.

FRANK O. CUPPY is the new manager of the Lafayette Independent Telephone Company, Lafayette, Ind. He succeeds O. T. Friberg who was elected secretary of the company.

ELECTRICIAN E. M. HART, who resigned his position with the Independent Telephone Company, Greensburg, Ind., on account of ill health, has been succeeded by William F. Qualls.

THE CLYDE TELEPHONE COMPANY, Clyde, O., now has 800 instruments in use. H. V. Becker is president and D. E. Fuller secretary of the company. The capital stock is \$30,000.

THE MARQUETTE TELEPHONE COMPANY, Marquette, Mich., has voted to increase its capital stock from \$60,000 to \$100,000. The new capital will be used in improving the system.

THE PEOPLE'S TELEPHONE COMPANY, Akron, O., is making many improvements, including the installation of new toll and transfer boards, under the direction of Manager W. F. Laubach.

THE HOME TELEPHONE COMPANY, Hamilton, O., now has over 2,200 subscribers in Hamilton, with 108 applications on the waiting list, and over 3,000 subscribers in the county, and had a net gain of over 300 during the past six months.

PORTSMOUTH, OHIO, will be the trunking station for the Louisville Central Home Telephone Company's long-distance service. All the wires will cross the Ohio river there and connect up with the wires of the United States T. and T. Company.

IMPORTANT IMPROVEMENTS will be made by the Lafayette Independent Telephone Company, Lafayette, Ind., in the immediate future. Considerable underground work will be done and a new switchboard installed, probably of the automatic type.

THE CITIZENS' TELEPHONE COMPANY, Decatur, Ind., has recently closed the most successful year on record. J. S. Bowers, F. M. Schirmeyer, E. X. Ehringer, Dr. D. D. Clark and Godfrey Christen were elected directors for the ensuing year.

THE HOME TELEPHONE COMPANY, Bedford, Ind., has increased its capital stock from \$75,000 to \$125,000 and elected the following officers: E. B. Thornton, president; W. N. Mathews, vice president; Charles W. Long, secretary, and W. A. Brown, treasurer.

THE BOARD OF DIRECTORS of the Citizens' Telephone Company, Columbus, O., recently declared the regular quarterly dividend of 1½ per cent. on its preferred stock and the regular quarterly dividend of 1¼ per cent. on the stock of the Franklin County Telephone Company.

THE HOME TELEPHONE COMPANY, Clarington, O., has increased its capital stock from \$5,000 to \$30,000. Under the direction of Manager H. M. Smith the company expects to extend its lines from Wheeling to Sistersville, W. Va., connecting with several long-distance lines.

RICHMOND, IND., is to have an automatic system. The Home Telephone Company has formally decided upon making the change. A very extensive underground system is being put in, practically an all cable plant. The reconstruction work will cost between \$150,000 and \$175,000.

A HANDSOME NEW BUILDING is being erected for the Akron Peoples' Telephone Company, Akron, O., by the Independent Telephone Building Company, which is merely a holding corporation for the telephone company. A complete automatic service will be installed in the new building which will cost \$35,000.

THE NEW ISSUE of United States Telephone preferred and common stock has just gone into effect. The preferred consists of \$636,800 and the common of \$1,100,000, which has been issued in exchange for securities carrying the control of Independent companies in Massillon, Findley, Fostoria, Columbiana, Lancaster, Mansfield, Youngstown, Zanesville and Huron and Stark counties, Ohio.

W. GILBERT THOMPSON, manager of the Hamilton Home Telephone Company, Hamilton, O., states that the famous auto owned by that company was not blown up and did not set fire to the company's warehouse. At the time of the fire the auto was 30 miles away, being used by the country troubleman, who takes care of 900 phones by its use. The warehouse, which was burned down, sure enough, has been replaced by a larger structure.

C. R. KEHOE, formerly wire chief, has succeeded John Smith as manager of the Citizens' Telephone Company, Jackson, Mich.

THE BOND COUNTY TELEPHONE COMPANY, Greenville, Ill., has increased its capital stock from \$6,000 to \$18,000.

MAYOR DUNNE'S longing for lower telephone rates has thus far awakened no responsive thrill in the bosom of the Chicago Telephone Company.

B. H. SKINNER, Detroit, Mich., who has been a Bell employe for many years and for the past six years was connected with a Chicago Bell house, has resigned and will enter the Independent field.

THE HOME TELEPHONE COMPANY, Champaign, Ill., is about to install the automatic system. Within the fire limits of both Champaign and Urbana an underground conduit system will be constructed.

THE RUSHVILLE TELEPHONE COMPANY, Rushville, Ill., and the Schuyler County Central Mutual Telephone Company have entered into an agreement whereby the two exchanges will be connected with a metallic circuit line.

THE CITIZENS' TELEPHONE COMPANY, Muskegon, Mich., has increased its capital stock from \$50,000 to \$100,000 by the issuing of \$50,000 of preferred stock. The preferred stock carries dividends at the rate of 6 per cent., payable semi-annually.

JAMES L. KIRK has resigned his position as manager of the Sullivan Telephone Company, Sullivan, Ill., and gone to Beloit, Kas., where he has become manager of the local exchange. His successor at Sullivan is A. O. Harrison, of Rantoul, Ill.

MANAGER LOUIS PITCHER of the Home Telephone Company, Dixon, Ill., makes the statement that there now is an Independent telephone for every 10 inhabitants in the city of Dixon and in 3 out of every 4 farm houses in the territory outside of the city. And yet the Bell people say that Independent telephony is a failure.

THE FINAL ORGANIZATION of the Cairo and Thebes Telephone Company, Cairo, Ill., was perfected recently. The necessary capital for building the line has been subscribed and the following officers were elected: President, W. W. Wilbour; vice president, Albert Brown; secretary, John S. Norman; treasurer, C. C. Miller. The company will build a trunk line between Cairo and Thebes. Branches will have to be paid for by individuals desiring them.

AT LANSING, MICH., the right to the use of a certain telephone number is one of the issues involved in a lawsuit. A liveryman sold out to another and agreed not only from re-engaging in the business, but to allow the new owner the use of the telephone numbers of the old establishment. The seller, however, started in business again and induced the telephone companies to give him his old numbers. An order for him to show cause has been issued by the court.

#### THE WEST AND NORTHWEST.

MELVIN W. KOONS, formerly of Minneapolis, has succeeded Charles K. Willard as manager of the Citizens' Telephone Company, Mankota, Minn.

SECRETARY L. D. STAPLES states that the new Rockville Road Rural Telephone Company, St. Cloud, Minn., is nearing completion. There are now six rural lines running out of St. Cloud which give the new company a range of three counties.

THE NORWICH TELEPHONE COMPANY, Norwich, N. D., under the management of W. E. Pierce, although not yet a year old, has already established branch stations at Granville, Deering, Saline and Amy. Long-distance connections will be made at the earliest opportunity.

THE GREAT WESTERN TELEPHONE COMPANY, Fergus Falls, Minn., and operating exchanges at Breckinridge, Campbell, Washington, Lisbon, Milner, Fairmont, Hankinson and

Forman, N. D., and 213 miles of toll line, has sold out to the Northwestern (Bell) Telephone Company.

THE NORTH DAKOTA INDEPENDENT, Fargo, N. D., has purchased the Casselton and Valley City franchises and expects to secure control of the exchange at Wheatland.

THE DAKOTA CENTRAL COMPANY, Aberdeen, S. D., has appropriated \$250,000 for the purpose of providing additional circuits and facilities for handling its business during the coming year.

MESSRS. STONE AND GREEN, formerly connected with the Tri-State T. and T. Company, St. Paul, have opened an office at Minneapolis and engaged in the construction and engineering business.

CHARLES O. HARRIS, Salt Lake City, Utah, representing Kierulff & Co., has applications for franchises pending in Juab county, San Pete county and Richfield county, and in the cities and towns of Nephi, Fountain Green, Moroni, Mt. Pleasant, Ephraim, Spring City, Manti and Richfield.

AT A MEETING OF THE DIRECTORS of the Citizens' Telephone Company, Mankato, Minn., a large appropriation was made for cable extensions. The regular semi-annual dividend of 3 per cent. on preferred and 4 per cent. on common stock was declared.

BIG TIMBER, MONT., has a new telephone company. It is called the Dry Creek Telephone Company and has a capital stock of \$10,000. A line will be built from Big Timber to Grey Cliff. The stockholders are F. M. Lamp, L. C. Olmstead, John T. Esp, W. J. Knapp, T. V. Overhuls and R. Roberts. F. M. Lamp is secretary.

A CIRCULAR DENOUNCING the methods of the Bell Company has been circulated by the Dane County Telephone Company, Madison, Wis. The Independent company has many more 'phones in use than its monopolistic competitor, and in order to get a foothold the Bell offers 'phones to new patrons free for 3 months. It is to be hoped that the Wisconsin public is too intelligent to be caught with such bait which is thrown out to cripple the Independent company so that afterward the Bell can charge as much as it may please.

#### THE WEST AND SOUTHWEST.

SUPERINTENDENT A. J. MILLER, of the Texas T. and T. Co., announces that the patrons of the company in Llano, Tex., can hereafter use, without cost, 143 rural telephones outside of the city.

MANAGER C. E. HARRIS announces that the Roosevelt County Telephone Company, Texico, N. M., is putting in new exchanges at that place, Melrose and Elida. The company also has toll lines connecting these points.

THE EMPORIA TELEPHONE COMPANY, Emporia, Kas., now has 2,100 instruments in use, with branch exchanges at Neosho Rapids, Olpe, Roscan and Plymouth. The company, which is under the management of W. W. Finney, has both Independent and Bell connections.

AT LITTLEPORT, IOWA, the Roosevelt, Littleport and Doe Creek Valley Telephone Company has just been organized and built. Its manager calls it "the most popular telephone line in Iowa, if not in the United States." A little enthusiastic, perhaps, but enthusiasm always wins.

IN ORDER TO THWART ACTION on the Independent telephone ordinances, it is stated, the Bell Company tried to get members of the Omaha (Neb.) city council out of town by promising them a prolonged junket at the expense of the Bell treasury. The game didn't work, and a franchise has been granted to the Omaha Home Telephone Company, subject to approval by popular vote.

A FINE INDEPENDENT SYSTEM is being developed by the Roswell Telephone and Manufacturing Company, Roswell, N. M., of which John W. Poe is president and J. P. Clunch manager. The Roswell exchange, with 451 telephones, co-operates with the exchanges at Hagerman, Lake Arthur, Artesia and Carlsbad and has Independent toll connections with Elida and intermediate points.

THE CAPITAL STOCK of the Ballwin Mutual Telephone Company, Ballwin, Mo., has been increased to \$12,000.

THE WOODBINE TELEPHONE COMPANY, Woodbine, Iowa, has just completed a new telephone line in Grove township.

THE MARTIN TELEPHONE COMPANY, Webster City, Iowa, has been re-incorporated and the capital increased from \$25,000 to \$100,000.

THE WHITING TELEPHONE COMPANY, Whiting, Kas., which is the private property of J. P. Christensen, has been adding many 'phones to its system of late.

THE COLONY TELEPHONE COMPANY, Colony, Kas., of which H. W. Sterling is the proprietor, now has Independent toll connection with all points in Anderson county.

THE CONTROLLING INTEREST in the Benton County and Vinton Telephone Company, Vinton, Iowa, has been acquired by S. S. Lichty and others. Mr. Lichty has been elected president and manager of the company.

THE CORN BELT TELEPHONE COMPANY, Waterloo, Iowa, has completed long-distance lines from Waterloo to Webster City, Sioux City, Council Bluffs, Iowa, and Sioux Falls, S. D., as well as eastward toward Chicago.

THE INDEPENDENT LINES of Iowa and Nebraska are now connected by wire strung across the Missouri river between South Omaha and Council Bluffs, supported by towers 120 feet high. About 40,000 telephones in Nebraska are thus connected with 50,000 or 60,000 in western Iowa.

MANAGER E. H. SIDWELL of the Johnson County Telephone Company, Iowa City, Iowa, states that the company's toll lines between Iowa City and Cedar Rapids are being rebuilt and a No. 9 iron circuit added for local business and stations, leaving two through copper wires which the management contemplates duplexing, making a third circuit.

THE DISTRICT COURT AT ELDORA, IOWA, has rendered an interesting decision in the case of Rev. Plummer, of Radcliffe. The preacher had testified against the manager of the local telephone exchange, who is a druggist, in a liquor case, whereupon the latter refused further telephone service to the clerical witness. Judge Richards, after hearing the case, ordered the manager to restore the 'phone.

#### THE SOUTHERN STATES.

THE U. S. GOVERNMENT has installed a complete telephone system at Fort Sam Houston, near San Antonio, Tex.

THE WYOMING TELEPHONE COMPANY, Beckley, W. Va., has secured a franchise to construct a telephone system within the county.

WORK IS NOW PROGRESSING at Sulphur Rock, Ark., on the construction of a local telephone system. J. C. Gill is business manager of the new company.

MRS. A. M. BRETT, El Paso, Tex., well-known in Independent telephone circles, has recently secured a franchise for a telephone system in Mineral Wells, Tex.

THE CITY OF BARDSTOWN, KY., is having trouble with the Cumberland Telephone and Telegraph Company, and it is more than likely that its franchise rights will be transferred to a local Independent company.

THE TELEPHONE EXCHANGE and toll lines at Scottsburg, Ala., have passed into the hands of a new company, of which Dr. J. A. Lipscomb is president and D. E. Barcial manager. The system will be improved and extended.

SEVERAL BRANCH EXCHANGES are at present being built by the Russellville Home Telephone Company, Russellville, Ky., which was organized recently with a capital of \$50,000. Harry H. Smith is secretary and Sam J. Rose manager.

THE HOME TELEPHONE COMPANY, Jonesboro, Ark., is installing a complete automatic plant which will be in operation by January 1. The same company is rebuilding its exchange at Nettleton where its business has been growing rapidly of late.

AT A RECENT MEETING of the Northeast Texas Telephone Association, at Greenville, Tex., the following officers were elected for the ensuing year: President, E. M. Chamberlain, Greenville; vice president, G. M. Daniels, Lone Oak; secretary and treasurer, E. Graham, Paris.

ONE OF THE BIG SYSTEMS recently organized is the Subscribers' Mutual Telephone Company, Baltimore, Md. It is capitalized for \$500,000 and will compete for patronage at lower rates than those of the existing companies. The president is J. L. Conard, Trenton, N. J. Charles C. Wight, of Baltimore, is secretary and treasurer.

ONE OF THE NEW COMPANIES which will play quite an important part in the development of the Independent field in the South is the Todd County Home Telephone Company, Elkton, Ky., of which Ben Petrie is president. The company has a capital of \$35,000 and exchanges at Elkton, Allensville, Trenton and Guthrie. W. B. Carvell manages the business at Allensville.

THE FIRST MEETING of the Second District Kentucky Independent Telephone Association was held recently in the offices of the Fayette Home Telephone Company. The aim and purpose of this association is to cement together in a firmer union all Independent telephone interests in the state of Kentucky. The following companies were represented at the meeting: The Fayette Home Telephone Company, the Cynthiana Home Telephone Company, the Bourbon Home Telephone Company, the Jessamine Home Telephone Company, the Bastine Home Telephone Company, and the Lawrenceburg Independent Telephone Company.

#### PACIFIC COAST STATES.

THE CLOVERDALE TELEPHONE COMPANY, with a paid up capital of \$2,000, has been incorporated at Cloverdale, Ore., by Charles Ray and others.

ITS CAPITAL STOCK has recently been increased to \$12,000 by the Goldendale T. and T. Company, Goldendale, Wash. The new stock was subscribed for and paid in at once.

UNDER THE DIRECTION of Manager George B. Woodbridge the San Diego Home Telephone Company, San Diego, Calif., is making extensive improvements in town and country.

THE STOCKHOLDERS of the Interstate Telephone Company, Spokane, Wash., will vote on November 2 on a proposition to issue \$500,000 of common and \$500,000 of preferred stock and to authorize a \$500,000 bond issue, the proceeds to be used for extending the company's system.

COL. J. M. C. MARBLE, president of the Home T. and T. Company, Los Angeles, Cal., has resigned his position owing to the press of other business in connection with the merging of all Independent telephone companies in Southern California, outside of Los Angeles. He is succeeded as president by A. B. Cass, former vice president, and W. C. Patterson has been elected to succeed Mr. Cass as vice president.

INDEPENDENT BUSINESS has been increasing so rapidly in Los Angeles, Cal., that the Home T. and T. Company of that city has been compelled to plan a new building, 70 by 104 feet, on West Adams street to take proper care of the new business in the extreme west end of the city. The new exchange will be built of re-inforced concrete, with solid stone front, and equipped with 10,000 main line automatic telephones.

ALBERT HELD, architect of Spokane, Wash., has completed plans for headquarters of the Home Telephone Company in Spokane to cost \$60,000. The structure will be of re-inforced concrete, fireproof, and is to be completed in May, 1907. It will have a frontage of 71 feet with a depth of 100 feet, two stories high and basement. A sub-station to cost \$5,000 will also be erected in Spokane. The automatic switchboard will be installed on the second floor of the main building.

FREDERICK BOUGHTON, prominently connected with the Farmers' Telephone Company at Ritzville, Wash., southwest of Spokane, has joined the ranks of the benedicts, his bride, Miss Amy Traves, coming all the way from Plymouth, Eng., to join him in Spokane. The wedding took place in All Saints' cathedral a few days ago, Rev. Dean Alfred Lockwood officiating. The bride arrived at 9:30 o'clock in the evening and half an hour later she was Mrs. Boughton. They will live at Ritzville.

# ILLINOIS INDEPENDENT TELEPHONE ASSOCIATION

## EDITORS

This Bulletin is edited by the publicity committee of the Association. All communications intended for it should be addressed to J. H. Hackett, chairman, Jacksonville, Illinois.

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## Problem that needs Solution.

Independent telephone companies in some of our large cities are facing a condition brought about by a surfeit of business. There is no other business except the telephone business where such a condition can exist. Ordinarily, the more business the more profitable it becomes. This is true of the telephone business up to a certain point, beyond which it is unprofitable without higher rates. Indianapolis is a case in point. In 1898 the Bell company had about 2,000 telephones in that city. Its rates were \$72 for business houses and \$48 for residences. In that year an Independent company commenced business there, charging \$40 for business and \$24 for residence phones, the amounts specified in its franchise. Business came rapidly. At the end of the first year this company had 2,500 telephones in use, since which time the business has rapidly increased until now the Bell has 7,000 telephones in use and the Independent company about 10,000, and the latter has asked for an amendment to its franchise enabling it to advance the price of phones up to a paying basis. The old company is disposed to make merry over the predicament the new company finds itself in. It is probable that the new company did not foresee clearly its future condition, not realizing, first, that it must provide for 10,000 phones, and, secondly, that as a telephone business changes from a small plant to a large one, the cost of operation increases out of proportion to the increase of income. That such is the case is now generally conceded. So it seems that the telephone business is unique in that it is the only business that can actually be embarrassed with too much success. The Indianapolis situation is only mentioned to bring up a question that is looming up before the Independents and which many of them will have to meet in the near future, and that is where the line of profit changes to loss by reason of too many phones on one switchboard. The Independents never anticipated such a condition and are not prepared for it. Franchises were secured by the promise of lower rates which were made a condition in the franchise itself. It is not an easy matter to get city councils or the public to understand the situation, much more to amend a franchise allowing an increase of telephone rates. There seems to be no solution at hand just now.

But to the question: How many telephones can be taken care of at one exchange at the rate named in the franchise, and still make money? will have to be settled by each company for itself, as the conditions differ in every case; but still it is desirable that some general information be given in the telephone journals that will assist local managers in arriving at a conclusion, or at least an approximate estimate. Who will do it?

## The One who can do Things.

Progressive employers are always looking for the exceptional man or woman, the one who can step out from the crowd and do things in an original way, who can economize in processes, who can facilitate business. They are always looking for the earmarks of leadership, of superior ability, for the progressive with new ideas who can help them to be more of a success.

They know very well that they can get any number of automatons, multitudes who will do a thing just well enough to keep their places—but they are looking for originality, individuality, for up-to-date methods.

They want employees who can put things through with vigor and determination, without lagging, whining, apologizing or asking questions. Nothing can bar the advancement of employees of this kind. Nothing can keep them down.

If by chance someone above you is actually trying to prevent your promotion for selfish reasons, it ought to be very flattering to you to know that he is trying to keep you back and should make you all the more determined to get ahead.

It is a pretty good indication that there is some reason for his or her fear and that you have material in you for a better place. This should encourage you to redouble your efforts to do your work so well, to stamp such superiority upon everything you touch, to acquit yourself so much better than the man or woman who is trying to keep you down—to be so much pleasanter, so much more of a man or woman, that it will be only a question of time when you will get the position you are striving for, or perhaps a better one.

The writer has been an employer of men and women for twenty years in the telephone business, and by experience and observation has seen so many young men and women, who did not know the value of time, to themselves or their employer. The only object to them seemed to be payday. This, I will admit, is a stimulating medium, but should be a secondary thought. When a young man or woman is just beginning life in the business world the greatest thought should be to be something, to know something about what they profess to know. No business man should allow petty jealousies to exist among his employees. A friendly rivalry is all right, and should be encouraged, but too many of our managers and business men of today have pet employees. This is a serious mistake. Nothing will work more harm to a business than to allow one employee to do as he or she pleases to the chagrin of the others.

GEO. H. GLASS.



# Two Telephone Systems a Good Thing

There has recently been distributed among banks and business houses of Illinois a pamphlet entitled "Independent Telephone Movement" and bearing the name of no author or publisher. There being no stamp or imprint of any kind on the pamphlet to indicate the source from which it came, the only index of its fatherhood is its contents.

Anyone at all familiar with the telephone business knows that it is fostered by the Bell Telephone Company. The falsehoods and misrepresentations contained in it could not have originated anywhere else. The secretary has made some inquiries regarding some of the places named in the pamphlet as examples of Independent telephone failures. He has written many letters to prominent business men in various cities, a few samples of which follow.

The writer was in Fond du Lac, Wis., recently and talked with a number of the leading business men of that city, many of whom expressed regret that competition did not exist there. The rates now being paid are from 25 to 40 per cent in excess of rates paid in cities of like size that have competition, and he has letters from Oshkosh indicating the same condition of affairs.

Among places mentioned in Illinois to clinch their argument that two telephone systems is a nuisance is Decatur, where Mr. Hankins is not only making it exceedingly interesting for the Bell Company, but has compelled them to give better service at cheaper rates; and Bloomington, where the Kinloch-Bloomington Company have recently re-built almost their entire plant and largely outnumber the Bell Company, giving a splendid service at reasonable prices. Outside the state, Dayton, Ohio, and Sioux City, Iowa, were held up in scorn as examples of the folly of establishing a competing telephone system.

Here are some letters from men who live there:

MILCHRIST & SCOTT,  
LAWYERS,

Suite 703, 704,  
Security Bank Building.

C. B. Cheadle,

Secy. Illinois Independent Tel. Assn.,  
Joliet, Illinois.

Sioux City, Iowa, Sept. 19, 1906.

Dear sir: Your favor of the 18th inst. received. The Sioux City Telephone Co. (Independent) has had a very satisfactory business experience. It organized and began business last November and now has about 2,800 subscribers. As far as I have heard it gives excellent satisfaction.

The Bell Telephone Co. has given much better service here since the new company started and I am of the opinion that competition in the telephone business is essential to insure thorough and efficient service.

Yours truly,  
WM. MILCHRIST.

Mr. C. B. Cheadle,  
Joliet, Illinois.

Sioux City, Iowa, Sept. 25, 1906.

Dear Sir: The reply to your favor of the 18th inst., relative to telephone service has been delayed on account of my absence from the city.

Some time ago the Home Telephone Company secured a franchise and began business here. The rates for service were reduced by that company and the Bell Telephone Company met the reduction by a still greater cut in prices. The Home Telephone Company had but few connections with outside toll lines and was, therefore, in a poor position to offer competition for anything but city business. The reduction in rates made by the Bell Telephone Company was so attractive to the general public that the Home Telephone Company received but little support and was shortly compelled to go out of business.

Its short career demonstrated, however, that competition in the telephone business could be made to result in reduced prices for the public. Of course, the Bell Telephone Company restored rates as soon as it had acquired the properties of the Home Telephone Company, but if my recollection serves me right the rates were not restored to the full price charged before the Home Telephone Company entered the field.

Recently the Sioux City Telephone Company has established an exchange and lines in Sioux City which are operated through automatic 'phones locally. This service is furnished to the public at a lower rate than that charged by the Bell Telephone Company. So far the Bell Telephone Company has not sought to meet the price made by the Sioux City company. I think it seeks rather to hold its patrons and gain new business on the basis of the quality of service which it renders.

The Sioux City Telephone Company has opened to the trade interests of this city a system of Independent lines not heretofore accessible through the Bell lines and has brought us within talking reach of fifteen thousand more 'phones. At least that is the number claimed by the Sioux City company.

I, therefore, feel that competition has proved beneficial to our business interests for the reason that the new company has furnished what seems to me is a better service at a less rate than the Bell Company and has opened territory which the Bell Company did not reach. I think it fair to assume that both companies will endeavor to give the public here the best service possible at the lowest practicable rates to insure successful operation. Without competition the public is certainly at the mercy of a company both for service and rates. I, therefore, feel that competition in this line of business is not only desirable, but is essential for the interests of the business public.

Very truly yours,

Mr. C. B. Cheadle, Secretary,  
Joliet, Illinois.

September 20, 1906.

Dear Sir: Replying to your favor of the 18th I would say that I have seen the pamphlets you refer to issued (presumably) by the Bell Telephone Company.

The Independent company they refer to was known as the Home Telephone Company and some six or seven years ago was sold to the Bell people. It was never properly organized, nor financially strong enough for the work it had undertaken, but was a popular movement and the demand for telephones was stronger than the company was able to supply and, with no resources to draw upon, it was deemed best to the management to take that time to dispose of the company.

Its failure was no reflection upon the general proposition of investment in Independent telephone companies. If anything, it was the victim of prosperity and too much popularity.

About a year and a half ago the Sioux City Telephone Company was organized as an Independent company and is ably managed and in a strong position financially. Its success has been very gratifying to the stockholders and to the community in general. It now has about 2,800 telephones in use and it is generally accepted as a fact that it has more patrons at the present time than the old Bell Company.

Yours truly,

THE CANBY, ACH & CANBY CO.

Successors to  
Canby, Ach & Canby.  
Spice Grinders,

Coffee Roasters and Baking Powder Manufacturers.

Dayton, Ohio, Sept. 21, 1906.

Illinois Independent Telephone Ass'n.,  
Joliet, Ill.

Gentlemen: It is our judgment that a decided advantage has accrued to this community through the installation of the Independent telephone.

Prior to their coming it was exceedingly difficult to get any accommodation from the local company, or reasonable attention to complaints, and these complaints were occasioned only too frequently through poor service.

Since the coming of the new company the rates of the old company have been reduced, and the quality of the service greatly enhanced.

It is simply the old story; where one concern has every-

thing its own way they are the master; but when competition appears they can be reasoned with.

Yours truly,

THE CANBY, ACH & CANBY CO.  
Dayton, Ohio, Sept. 22, 1906.

The Illinois Independent Telephone Association,  
Mr. C. B. Cheadle, Sec'y.,  
Joliet, Ill.

Dear Sir: Replying to your letter of the 20th inst. I do not hesitate to say very frankly that competition in the telephone business, as experienced at Dayton, has been a desirable thing.

Previous to the advent of the Home Telephone Company here, we paid exorbitant prices for greatly inferior service over the Bell, and for a very limited number of subscribers.

Since the advent of the home company, the Bell Company has been very actively canvassing for subscribers, and has increased its list very materially, and is giving, at least, fair service. The Home Telephone Company is giving service of the best character, and always has been so. And the experience of the business man who looks at the matter in a proper light, although he pays slightly more for the two telephones than he originally paid the Bell Telephone Company for one, finds, that if he is obliged to keep both, that he gets, on account of the much greater number of subscribers which it is possible to reach, better and cheaper service than he ever got before.

I am in thorough accord with your statement that efficient telephone service, and fair prices, are properly obtained only through competition, and that it is impossible to combat argument in favor of a second telephone company, as it results in cheapening and bettering the service everywhere.

Yours very truly,

J. C. REBER.

### Comparison of Telephone Rates.

We are indebted to the bulletin of the Indiana Independent Telephone Association for the following interesting data. A number of the cities in Illinois will be interested in this table. Comment seems unnecessary.

#### TELEPHONE RATES.

Cities having only Bell service.	Population	Business	Residence
Milwaukee,	285,315	\$66.00	\$48.00
New Haven, Conn.,	108,027	84.00	48.00
Omaha, Neb.,	102,555	84.00	36.00
Richmond, Va.,	85,050	72.00	36.00
Nashville, Tenn.,	80,865	84.00	42.00
Hartford, Conn.,	79,850	84.00	48.00
Bridgeport, Conn.,	70,996	84.00	48.00
Evansville, Ind.,	59,007	66.00	30.00
Manchester, N. H.,	56,987	69.00	.....
Augusta, Ga.,	39,441	72.00	36.00
Pawtucket, R. I.,	39,231	66.00	48.00
Spokane, Wash.,	36,848	72.00	36.00
Charlotte, N. C.,	18,091	48.00	30.00
Pensacola, Fla.,	17,747	42.00	30.00
Norwich, Conn.,	17,251	60.00	36.00
Average Population			73,150
Average Business Rate			\$72.20
Average Residence Rate			\$39.42
Cities having both Independent and Bell.	Population	Business	Residence
St. Louis,	675,238	\$72.00	\$48.00
Cleveland,	381,768	72.00	48.00
Minneapolis,	202,718	48.00	30.00
Indianapolis,	169,164	40.00	24.00
Kansas City,	163,752	54.00	36.00
St. Paul,	163,065	48.00	30.00
Toledo,	131,822	52.00	32.00
Syracuse, N. Y.,	108,374	44.00	30.00
Los Angeles,	102,479	60.00	24.00
Albany, N. Y.,	94,151	48.00	24.00
Grand Rapids,	87,565	36.00	24.00
Seattle, Wash.,	80,671	48.00	30.00
Wilmington, Del.,	76,508	36.00	24.00
Trenton, N. J.,	73,307	36.00	24.00
Duluth, Minn.,	52,969	36.00	24.00
Average Population			170,901
Average Business Rate			\$49.00
Average Residence Rate			\$30.10

### In Memory of Mrs. B. F. Wasson.

SOUND WAVES is called upon to pay a last tribute to the memory of a noble wife and mother, Mrs. Lilly Belle Wasson, of Clinton, Ill., who entered into rest September 5, 1906, after seven years of suffering which she had endured in a truly heroic spirit.

Mrs. Wasson, who was the daughter of Samuel W. and Elizabeth Clay, was born in Logan county, Illinois, one and a half miles east of Lawndale, on April 9, 1865. Here she was reared, and her education was obtained in



MRS. BYRON F. WASSON

the public schools of Atlanta, from which she graduated with the honors of her class. Following this she was a teacher in the country schools for five years and in some higher schools for two or three years. Her home was in Atlanta for about eighteen years. There, on August 24, 1886, she became the wife of Byron Fillmore Wasson. They at once left for Cottonwood Falls, Kas., where Mr. Wasson was principal of the schools for three years. After this time her health seemed to be failing and they returned to Illinois and located at Midland City where Mr. Wasson was principal of the schools for two years. They followed two years at Elkhart, and three years at Bluffs, Mr. Wasson being principal at each place. At Bluffs Mrs. Wasson taught the primary grade for two years. Their next move was to Lincoln, where Mr. Wasson had been made superintendent of the Home Telephone Company, and later they removed to Farmer City, where they engaged in the same business for themselves. When the Clinton exchange was purchased five years ago, it being the center of the district, Mr. and Mrs. Wasson went there. She was afflicted with heart trouble and had been a sufferer for many years, though she complained but little. Realizing that life was not hers for long she was ready at all times to go to the better world, and had given warning to her family, to whom she was greatly devoted, two years ago that her days were numbered. She is survived by her husband, two sons, Earl and Dean, and her venerable father, Mr. S. W. Clay.

Mrs. Wasson was the first secretary of the Farm and City Telephone Company at Clinton, Ill., and held a large block of the stock when the National Telephone and Electric Company bought it out. At one time she had one of the largest interests in the telephone business in De-

Witt county and took great interest in driving over the lines with her husband. She could see and locate a cross wire as quick as an expert trouble shooter, but in later days, owing to bad health, she was obliged to give up her inspecting trips and be satisfied to let the work be done by some one else. The last convention she attended was the National Interstate at Chicago in June.

### That Big Bell Bond Deal

The following is from Finance, a weekly magazine devoted to investments, stocks, bonds etc:

Boston, Aug. 20, 1906.

I have been a holder of American Telephone shares for many years, and while I am not disposed to sell my holdings at this time, I am surprised and disappointed that the stock does not advance commensurate with the advance in stocks which cannot show the earnings or the management which American Telephone can. When do you think the Telephone syndicate which underwrote the \$100,000,000 bonds will be able to sell their holdings? I presume the company must be a big borrower of money? Is it so?

X. Y. Z.

It may be that the manipulators of the Am. T. & T. Co. affairs overshot their mark when they undertook to discredit Independent telephone securities. Quite certain are we that the tremendous issue of bonds underwritten by J. P. Morgan & Co. and Kuhn, Loeb & Co., will not find a ready market in the west.

The attack of President Fish and his associates on independent telephone securities will call attention to the securities of the American T. & T. Company, and upon careful investigation by the unprejudiced investor he may conclude to put his money elsewhere.

X. Y. Z. asks a question that is amusing, to say the least. He says: "I presume the company must be a big borrower of money. It is not so?" Well, yes, rather so, according to our idea of bigness!

One hundred and fifty millions of dollars is the largest loan ever asked for by any corporation at any one time, so far as we recollect. There are but a few banking firms in the world which would undertake to float such an immense bond issue and possibly Kuhn, Loeb & Co. and the J. P. Morgan Co. will have considerable trouble in unloading their bonds on to the public as fast as they expected to. But the bonds must go sooner or later as both firms are entirely responsible for all their contracts.

### ILLINOIS FIELD NOTES.

DID IT EVER OCCUR to you how much cheaper telephone service is than it used to be before competition came along? In Will county, for instance, there used to be 600 telephones and a subscriber paid \$60 for an independent line business telephone or at the rate of 10 cents per annum for each connection. Since competition came along one can get a connection with 5,400 telephones for \$30 per year for an independent line business telephone or at the rate of a trifle over ½ cent for each connection per annum.

DID IT EVER OCCUR to you, too, that as a good and sufficient reason why a person should take your telephone is it's worth to him more than the other because he gets more connections that he wants. The average subscriber does not care much for connection with New York, San Francisco or Kalamazoo. What he wants is his neighbors and neighboring towns.

OVER IN LEE COUNTY the Bell Company are about out of business. They recently went through the

county telling the people they would furnish cheaper telephone service than the Independents. Let us see. They have less than 300 telephones in the county. They charge \$12 per year or four cents for each connection per annum. The Independent company of Dixon owns and has connections with 3,000 telephones which, at \$18 per year, is 6-10 of one cent for each connection. So, you see, the Bell Company charges nearly seven times as much as the Independents do for their service and, if you consider the quality, it would be about thirty times as much.

THE CITIZENS' TELEPHONE COMPANY, Pekin, added 139 new subscribers from March 1 to Sept. 1, 1906, making a total number of telephones operated in the city 1187. The Pekin Telephone Company, the long distance branch of the Citizens', is operating exchanges in the following cities and towns, viz.: Havana, Delavan, Lacon, Green Valley, Manito and East Peoria. The total number of new telephones placed in the past six months is 412, making a total number of 2,685 subscribers. The Central Union (Bell), in the same territory, is operating 439.

CLYDE McNAUGHT was transferred from Green Valley to Delavan, Sept 1, and will have charge of the outside construction of that exchange. Mrs. Emma Withers was appointed manager of the Green Valley exchange.

THE METAMORA EXCHANGE is being rebuilt, new poles, new wire and cable is being put up and when the work is completed will be one of the up-to-date Independent plants in Central Illinois.

THE INTER-STATE COMPANY, Peoria, is forging ahead, and is fast becoming one of the leading exchanges in the state. When this stronghold is fully captured the central part of the state will be in the hands of the Independents.

### Paul Latzke in Success

Never in the history of the telephone has the Bell (so-called) had such a rap as that given it by Paul Latzke in Success Magazine. The publishers of that periodical say of Mr. Latzke: "He has made a deeper study of the telephone question than any other man in the world, and has, on a number of occasions, been called by legislative bodies as an expert in telephone matters." With this indorsement Mr. Latzke commenced a series of articles in the Success Magazine last February, continuing through several months, which has carried consternation into the ranks of the Bell people, in New York and Boston especially. The facts presented have long been known throughout the entire west, excepting in Chicago, where the Chicago Telephone Company, alias the Bell, alias the American Telephone & Telegraph Company, still has everything its own way. In nearly all other parts of the United States and the Dominion of Canada, the struggle for supremacy still goes on between the Bell and the great army of Independent companies; so far decidedly in favor of the latter, according to Mr. Latzke and all other authorities, except those connected with the literary bureau of the Bell Company.

## BULLETIN NO. 1

## PROVINCE OF MANITOBA TELEPHONE NOTES AND COMMENTS

Persons interested in the Telephone situation in the Province of Manitoba should address **MR. F. DAGGER**, Provincial Telephone Expert, Parliament Building, Winnipeg, Man.

Subscriptions and advertisements should be sent to **SOUND WAVES**, 860 Monadnock Bldg., Chicago, Ill.

## ANNOUNCEMENT

**SOUND WAVES** takes pleasure in presenting to its readers the first of its Manitoba bulletins. These bulletins will be a special feature for one year at least.

The telephone question in the rich and rapidly developing province of Manitoba is of such momentous economical and industrial interest that this journal, which aims to encourage the cause of Independent telephony everywhere, proposes to keep its readers informed of the progress of the agitation now going on there.

The general scheme of the Manitoba government is outlined in this Bulletin by Premier Roblin, and in the speech



**FRANCIS DAGGER**,  
Telephone Expert for the Government of Manitoba

delivered by Hon. Colin Campbell, attorney-general, which is reproduced in full in the general reading pages of this issue.

The government has secured the services of Mr. Francis Dagger in the capacity of telephone expert. There is no man more capable of educating and eliciting the interest of the people in the vital subject of cheaper telephone rates and more efficient service, nor one who is more familiar with the tricks and wiles of the Bell Company whose agents are, of course, opposing the plans of the government with their accustomed unscrupulousness.

## THE PROVINCIAL TELEPHONE POLICY.

The action of the provincial government in employing an expert for the purpose of educating the people in regard to the question of a publicly owned telephone service is most commendable in view of the vote to be taken by the municipalities on this subject in December next. It would be very unfortunate if this vote were allowed to be taken before the public mind had been afforded an opportunity of studying the proposed telephone policy intelligently, by the aid of facts and figures, which only a specialist who has made a study of the telephone question is in a position to supply.

It is regrettable, but nevertheless true, that on questions of public policy the people are in the majority of cases misguided by the unreliable and unscrupulous statements of self-interested corporations, who spare neither time nor money in disseminating literature which to the layman appears reasonably convincing, but which will not bear the analysis of anyone who has a perfect knowledge of the actual conditions. A striking illustration of this is to be found in a circular addressed to "The People of Manitoba," issued by the Bell Telephone Company, in March last, which, while it is a very plausible appeal for public support, contains hardly a single statement upon which, after analysis, can be based the remotest claim for such support.

This circular states that the "Bell" company has "taken its part in the development of this province" and has "shared the responsibilities of old timers." The admission, however, that it has closed up a number of exchanges, presumably because it could not make a large enough profit out of the people, does not indicate a very practical method of development or "sharing the responsibilities of old timers." The truth is that now the "old timers," whose responsibilities the company refused to share in the past, have developed the province into one of the greatest wealth producing centers in the world, this philanthropic corporation, fearing the advent of public ownership, returns to the province pleading penitence for its past neglect and promises to do anything and everything which it persistently refused to do prior to the inauguration of the present telephone policy of the provincial government.

The people are wise enough to look with suspicion upon a corporation which requires a Dominion investigation and provincial legislation to stir it into its present activity. There is always a certain section of the community which is good because it is compelled by law to be so, but it is not this class which contributes permanently to the well-being of the people. There is always a danger that as soon as the restraining influences are removed the old methods will be reverted to, and we see no guarantee that the Bell Telephone Company would be an exception to this rule should it again find itself in the position of a monopoly in this province.

The history of "Bell" methods in Canada and the United States is such that no community is safe in its hands without the restraining influences of competition, and even where the Independent movement is most successful it will be freely admitted that competition in telephone service is a necessary evil which can only be avoided under some system which affords the people absolute control. So far as the province of Manitoba is concerned, the people have it in their power to decide whether they will permit a corporation which for twenty-five years has treated the demands of the farmers for rural communication with contempt, in accordance with a policy primarily directed from New York, to control the telephone service, or whether they will themselves build and control, what can be made, the most complete and perfect system in the world, operated at a cost which will enable every farmer and citizen to enjoy the benefits of a service which is a necessity for the many but which the "Bell," by its past policy, has permitted to remain a luxury for the few. This question is one which the people must decide for themselves, and it is to be hoped that they will not overlook the fact that if they make the mistake of perpetuating a monopoly they will most assuredly have to foot the bill at a later day, notwithstanding the professedly conciliatory tone of the "Bell" literature and the almost philanthropic offers of "Bell" agents at this time.



# Premier Roblin Presents Policy of Government

**TELEPHONE POLICY**—That each municipal corporation shall be called upon at the next municipal election to declare whether they are in favor of a municipally owned telephone system or whether they prefer a corporation owned one. In effect, if they declare for municipally owned telephones and this works out to completion, each municipality will organize a telephone system and have a central office, including the city of Winnipeg, and the payment for the construction of such telephone system is to be provided by an issue of debentures by the municipality to be guaranteed by the government, and the interest on such debentures and the cost of maintaining the system when so organized is to be borne entirely and exclusively by the subscribers or clients of such system.

## GOVERNMENT'S TELEPHONE POLICY

There is another matter of government policy which I presume it is well for me to deal with for a moment tonight, inasmuch as it will probably be pressed more directly upon your attention in the near future than any other feature of the policy of the government. I refer to the government's policy in connection with public telephones. I believe that the telephone is a public utility, is a public necessity and therefore should be secured to every citizen within the country at cost; that no profit should be permitted on a utility of this kind to a private citizen or a corporation. In saying this I do not wish to be considered as having any desire to injure or impair in any way any companies or corporations that have been organized for telephone purposes. I am speaking purely from the standpoint of the public weal. This government felt compelled to take up the question of a public telephone when requested so to do by the Municipal union that was held in Brandon last year. There the reeves and mayors and others who were members of that union and who were present, agreed unanimously on the general principles by which a public telephone would be established in this province. The legislature acted upon the suggestion and made provision for such service. In doing so, it was, and is now declared to be, absolutely without party color or bias; the government is acting simply because it is an expression of the will of the people, and, no matter what the result of the plebiscite that is to be taken on this matter may be, the government will not claim a party victory. It will simply be the result of the opinion held by the citizens of the country, irrespective of party bias.

## POLICY OUTLINED

What is that policy? The policy is this: That each municipal corporation shall be called upon at the next municipal election to declare whether they are in favor of a municipally-owned telephone system or whether they prefer a corporation-owned one. In effect, if they declare for municipally-owned telephone and this works out to completion, each municipality will organize a telephone system and have a central office, including the city of Winnipeg, and the payment for the construction of such a telephone system is to be provided by an issue of debentures by the municipality to be guaranteed by the government, and the interest on such debentures and the cost of maintaining the system when so organized is to be borne entirely and exclusively by the subscribers or clients of such system. Thus, no man who lives in a municipality and does not want a telephone will be called upon to pay one cent for providing it for his neighbor. The trunk line or long-distance system is to be built by the province and the rate to be charged will simply be sufficient to pay interest on the bonds and the cost of maintenance.

## VALUE OF MUNICIPAL OWNERSHIP

We know that there are some people who are opposed to municipal ownership of any and all utilities; with such there is of course no use in any argument. There are others who believe, at least they claim they do, in government ownership, but they say that by virtue of the influence that surrounds a government the management is not satisfactory and the results disastrous. To those I would say that the policy of the government is that a commission of expert men in this line, so far as the operation of the line is concerned, be appointed and a business man for the business side, which certainly removes that objection. In other words, what a corporation can do the government

or a commission, authorized or created by the government, with equal brains ought to do equally well.

What are the advantages of such a system? The advantages are supposed to be a better service at a greatly reduced cost. It is stated on what is considered undoubted authority that the Bell Telephone people pay interest on a capitalization of \$420 in the United States on every telephone that they have in service. Independent companies, experts in this line have agreed in saying that a capitalization of from \$115 to \$125 per phone in cities and less in rural municipalities by \$50 to \$75, is ample for any service you choose to establish with the most modern appliances and switchboards. You will therefore see how easy it is for the government to give a better service at a reduced rate when, instead of paying interest on \$420, you only have to pay interest on \$120, or, in other words, about 25 per cent what the Bell pay on.

## PHONES ARE NECESSARY

I think that the telephone is just as essential for the convenience of the laboring man as for the millionaire, and therefore the duty of the government is to provide such a service at a cost that will not prevent the artisan and laboring man from hanging one on the wall of his house. I admit that we are seriously handicapped in this province. I admit further that I am grievously disappointed at the action of the Dominion government in refusing to allow us to deal with this matter as the interests of the people may demand. We asked authority to expropriate, to take over any and all systems in this province at a fair and reasonable valuation, not to take a dollar's worth of plant for 90 cents, but to pay 100 cents, or 105 cents for every dollar's worth of the plant we took. But when we remember that the minister of justice at Ottawa is Hon. Mr. Aylesworth, champion defender of the Bell Telephone company, I should not be disappointed; I should not be surprised unless it be that we are more seriously handicapped than we are by simply disallowing or refusing us the authority asked for.

But the people are supreme. Hon. Mr. Aylesworth or Hon. Roblin may stand in the way if they choose of a great reform of this kind, but if the people are united, Mr. Aylesworth and Mr. Roblin will either have to get out of the way or be crushed by the weight of public opinion.

## GOVERNMENT'S PRACTICAL METHODS.

The government, in order that mayors of cities, that reeves and councillors of municipalities might be better qualified to judge and to act in this connection, has secured the services of Mr. Daggar, probably the greatest expert in the cost of constructing and operating telephones in America, to advise, and he is now opening an office with a view of disseminating such information and data as will satisfy all on matters of cost, etc.

I noticed the other day that a fly-sheet was printed and distributed throughout this country, purporting to show that the municipally-owned telephone in the United Kingdom was a failure and citing Glasgow as an illustration—that they in Glasgow city, who have municipally-owned telephones, had realized that the telephone proposition was unworkable and had relinquished it. A greater or more misleading statement could not be made. What happened is this: The government have declared, by an imperial act, that after a certain day all telephones shall be the property of the state and shall be run the same as the telegraph, postoffice and kindred institutions. The city of Glasgow had to renew their license and the cost of renewal and other incidental charges were such, having regard to the limited time in which they could operate, that they said to the government: "Take it over now." And that is the simple explanation.

What is the cost of a telephone service in that country compared with Winnipeg—less than one-half under conditions one-half less favorable. A penny for a long-distance message of twenty-five miles—Two cents! Here it is twenty-five cents or more. I think, therefore, that I need not spend any more time in arguing with you as to the importance and necessity for the people to take hold of this matter and carry it on to a successful issue. The cost will not be anything. It will be floated and financed in such a way that no man will feel it to the extent of one cent and the maintenance will be borne by those who use the service.

# The Bell Company and the Public Press

Many honest people, themselves incapable of deception, wonder how it is that so many letters from "Old Subscriber," "Ratepayer," etc., appear in organs of a certain class, attacking public ownership of telephone plants and other public utilities, and also wonder where those reports of the "failure of municipal ownership" originate, and are inclined to attach a certain amount of credence to them as apparently emanating from disinterested sources.

*The Register* has stated, heretofore, that THESE LETTERS ATTACKING MUNICIPAL OWNERSHIP and reporting unfavorably upon its operation elsewhere, appearing in local papers during a campaign for municipal ownership, WERE WRITTEN BY AGENTS OF THE BELL TELEPHONE CO., AND THEIR INSERTION PAID FOR by that corporation. This statement we believe we have proof to uphold, if any be needed further than the connection known to exist between this powerful corporation and the papers it uses in this province and elsewhere.

Further than this, there is strong evidence to show that A CAST-IRON AGREEMENT WITH THE BELL CO. is signed by all papers in which their advertising regularly appears—an agreement THAT FORBIDS THE FREE DISCUSSION OF THIS ISSUE IN THEIR COLUMNS, and makes THESE SO-CALLED NEWSPAPERS THE PROPERTY OF THE BELL CO. in so far as their interests are concerned, JUST AS COMPLETELY AS IF THESE ORGANS WERE BOUGHT OUTRIGHT by the Bell company.

The following editorial from the *Toronto News* (Independent) comes very timely in reference to this matter, and is strong corroborative evidence of the truth of the statements we have made. The two clauses of the contract signed with THE BELL CO., are sufficient to show that in the district indicated this huge corporation PRACTICALLY OWNS THE PAPERS IT USES; that PUBLIC OPINION IS DELIBERATELY POISONED by them AND OPEN DECEPTION USED TO GAIN THEIR ENDS. The cases cited are similar to those occurring in the west at present, where even more bitter warfare is being waged owing to the municipalities, the new provinces, and even the federal government tending so strongly toward favoring the Roblin government's suggested system of joint public ownership of the telephone system by the municipalities, the provinces and the Dominion, each controlling within its sphere.

We believe that the contract now used by the Bell Co. to TIE THE PAPERS OF THIS PROVINCE HAND AND FOOT contains a further clause stating that

"No matter antagonistic to the interests of the Bell Co. shall be published by the party of the second part (the newspaper) during the life of this contract," (usually three years) also,

"Matter sent the party of the second part (the newspaper) shall be published as original matter, or as letters signed as indicated by the party of the first part (the Bell Co.) without advertising marks of any kind and amongst pure reading."

—or that words to that effect are used to arrive at the understanding through which such matter is foisted upon the public.

The editorial in the *Toronto News* is as follows:

"According to a writer in *The Success Magazine*, a month's work in Evansville, Indiana, cost the Cumberland Telephone Company, one of the Bell subsidiaries, over \$11,500, divided between the two local daily papers. One of these, *The Journal-News*, finally revolted, under pressure of local merchants, who threatened to withdraw their patronage. Later, it told all the facts connected with the sale of its columns and the columns of its contemporary. It is declared that for more than twelve years the Bell Press Bureau has been in active operation, and there is hardly a city, town or hamlet that has not been 'worked.'

"In New England, hundreds of newspapers of the second class have tied themselves to the Bell, hand and foot, under regular contracts which contain, among others, the following two clauses:

"1. The party of the first part (the newspaper) . . . hereby agrees . . . to furnish, whenever called on to do so by the second party (the Bell Co.), a three-inch space, single column . . . for such advertising or other matter as second party may desire. . . . 3. It is further understood that said first party (the newspaper) WILL AT ALL TIMES EXERCISE ITS GOOD WILL IN SAID SECOND PARTY'S INTEREST, AND CO-OPERATE WITH THE SECOND PARTY. . . ."

"*The Success* writer goes on to say that in Omaha a strong independent company, backed with adequate local capital, applied

for a franchise. The company guaranteed valuable returns to the city, low rates to the subscribers and high-grade service. But at once the local papers began publishing some "letters from our special correspondent," dated, apparently at St. Joseph, Kansas City, Louisville, St. Louis, and other cities where Independent plants were operating in opposition to the Bell. These letters detailed the loss and annoyance the people in those places were suffering, and how anxious they were to be rid of independent plants. The good people of Omaha who read these 'letters' in the *Bee* did not, of course, dream that they were simply the paid advertisements of the Bell Company, though their suspicions should have been aroused when the *World-Herald* printed a lot of similar 'letters.' Any novice might have seen that these 'letters' were written by the same gifted hand."

"There can be no objection to legitimate advertising over its own signature by the Bell Company or any other company. But it makes neither for the good reputation of the press nor for the public interest WHEN THROUGH ANONYMOUS LETTERS AND MANUFACTURED READING NOTICES AN ATTEMPT IS MADE TO CHLOROFORM OR MISLEAD PUBLIC OPINION."

Editor's Note.—The foregoing article is from the *Nepawa Register*, of Neepawa, Manitoba, to which town belongs the credit of establishing the first municipally-owned telephone system in Canada. WE WONDER HOW MANY NEWSPAPERS IN MANITOBA HAVE ENTERED INTO THESE CONTRACTS WITH THE BELL TELEPHONE COMPANY?

## THE BRITISH TELEPHONE SERVICE.

A leaflet containing the copy of an article published by the *Electrical Review*, of London, England, a journal which has always opposed municipal ownership, has been circulated in this province in an effort to prove that municipal ownership of the telephone service is a failure. The greater portion of this article is devoted to what is nothing more than a difference of opinion on the part of the government and the municipalities as to the value of the latter's plant in the event of a purchase. This is a condition which always exists between the buyer and seller of any commercial undertaking where the value can only be estimated, and as in this case it is the government which is trying to make the best bargain with the municipalities, the question of public ownership is not affected one iota by the result.

The article proceeds to comment upon the increase in subscribers gained by the National Telephone Company of Glasgow last year, as against that of the municipality, but it omits to state that in the same period the company lost \$150,000 by its desperate efforts to show a superiority, in numbers only, over the municipal exchange; and that if the same methods were adopted throughout its whole system the company would fall into the receiver's hands within a year. The truth is that in Glasgow the increase in the company's business is made up almost entirely of "party" lines (i. e., several telephones on the same line), while over 95 per cent. of the municipal subscribers have individual direct wire service. In July last year the numbers stood as follows: Company, 8,382 "direct," and 6,641 "party" lines; municipality, 9,273 "direct" and 289 "party" lines. The company's lowest rate to meet competition is \$6.08 per annum for 20 "party" line service; that of the municipality \$15.34 per annum for four "party" line service. Before the municipal exchange was started the rates were from \$41.40 to \$121.75 per annum, and the number of telephones below 7,000; now the highest municipal rate is \$25.60 per annum and the total number of telephones in Glasgow 38,000.

The British government has recently purchased the Glasgow municipal telephone plant for \$1,525,000, or just \$25,000 less than the valuation placed upon it by the municipality's consulting engineer. This fact demonstrates that, despite the contentions of the monopoly, the government preferred to acquire the municipal system and make it the base on which to carry out its policy of nationalizing the telephone service, rather than wait until 1911 when it is to take over the company's plant under an agreement which puts an end to the private ownership of telephone business in Great Britain. The indications therefore are that the government officials purpose to discard the company's plant in favor of the municipality's and to convert the greater part of it into junk five years hence. Truly not a very flattering tribute to those opponents of public ownership

who for years have been trying to convince the public that the Glasgow municipal telephone plant was obsolete and valueless.

It is also to be noted that the National Telephone Company of Great Britain, by whom the anti-municipal articles are inspired, has offered the municipalities a higher price for their telephone plants than the government. In the case of Glasgow a sum equal to the municipal engineer's valuation, plus the preliminary expenses before construction was started and a net profit of \$75,000, was offered, but the municipality preferred to sell to the government rather than place the citizens again at the mercy of the monopoly, even for such a short period as five years.

Those who circulate articles of this nature surely forget that in Great Britain the telephone question has been finally decided by the adoption of government ownership, and that the only issue, if such exists in the public mind, lies between the relative claims of municipal and state ownership. The days of telephone monopoly controlled by private corporation are ended in the old country, and it is nothing short of abject folly to suppose that the progressive and enlightened citizens of this province, at this early stage of their history, are willing to permit the "Bell" monopoly to fasten its yoke upon them. By so doing they would repeat a mistake which can only result, as it has done in Great Britain, in years of extortion, dissatisfaction, contention and an ultimate condition of affairs which will compel the establishment of a government service at a cost very many times greater than that for which telephone policy of the provincial government can be carried out in its entirety today.

### WINNIPEG TELEPHONE SERVICE COST.

In the report of the select committee on telephone systems issued by the Dominion government, page 491, there is an exhibit put in by the Bell Telephone Company of Canada, which is of particular interest to telephone users in the city of Winnipeg. It is a statement for the years 1900-1904 inclusive, showing the number of subscribers, total plant account, receipts and expenses in connection with that company's business in this city. From this we find that the average total expenses, including the cost of operation and maintenance of the service, for the five years works out to \$27.70 per telephone per annum. In the absence of any details it would not be possible to explain how the company arrived at these figures, but it is nevertheless true that, taking the records of the Independent telephone companies of the United States, this sum is an amount very much in excess of what it should be in a well managed system.

For instance, Mr. E. H. Moulton, the president of the Twin City Telephone company of St. Paul and Minneapolis, in his testimony before the Manitoba select committee on telephones, gave the cost of operation, maintenance, taxes, insurance and every possible expense attending the business of his company at various stages of its existence, and the average in his case equals \$14.53 per telephone per annum. Even this figure is high compared with other systems in the United States, but inasmuch as the Twin Cities have a telephone service as perfect as any on the continent, any additional expense is justified by the results.

What, however, we are at a loss to understand, is, why it should cost \$13.17 more per telephone per annum to maintain and operate a system in Winnipeg than in St. Paul and Minneapolis. The rates for telephone service in Winnipeg are \$50 per annum for business and \$30 for residences, and assuming that the expense of operation and maintenance was the same as in the Twin Cities and that subscribers received the full benefit of that reduced cost, the rates would be \$36.83 for business and \$16.83 for residence connections, and the company would still have the same profit as, according to their own version, they are earning under the present rates.

We believe we are justified in stating that what the Twin City Company can do, the Bell Telephone Company of Canada, with its 26 years of experience, should be equally able to accomplish, and these figures are calculated to create one of two impressions in the minds of thinking people, viz.: That either the latter company presented misleading figures to the telephone committee at Ottawa, or else, at the expense of telephone users generally, it is spending much more than is necessary upon the management of its business.

The Monetary Times of Toronto, in a recent article, says: "The telephone is not a producer. It is a convenience which is just like any other piece of machinery and therefore the finance of telephoning should be upon the basis of giving maximum convenience to business people at the minimum cost." To this we would add that it is not only in business, but in the home also, that the telephone is a convenience, amounting in innumerable cases to an absolute necessity, and there is no doubt whatever that if the service in this city was say \$15 per year

less than it is, thousands of citizens, who cannot now afford the existing rates, would avail themselves of the benefit of the telephone.

There is, however, another side from which to view this matter, and that is the position of those who already pay the present rates. According to the latest Bell statement there are 6,165 telephones in this city, and taking the Twin City company's figures of \$14.53 per annum as being an adequate amount for the maintenance and operation of the service here, telephone users are paying 6,165 times \$13.17, or a total of \$81,193.05 more than they should do for telephone service, as a result of the expensive management of the present company.

It must not be overlooked that the Twin City Company is operating for profit just as the "Bell" company is, and that a publicly owned system, operated at cost, would give the people a service at a much lower figure than any company would attempt to do. These figures alone are surely more than sufficient to justify the Manitoba government in its present telephone policy.

### CONTROL OF THE BELL TELEPHONE.

The Bell Telephone Company of Canada in a circular to the people of Manitoba makes the statement that it is strictly a Canadian corporation free from any control or contributions to any other companies. Out of 1,123 shareholders only 104 reside out of Canada.

We have no desire to be unfair to the Bell Telephone Company, in fact we would prefer to give that corporation the benefit of any statement, the accuracy of which may be in doubt. The statement we have referred to, however, is so inaccurate and misleading to the public that we believe it to be our duty to state the following facts:

The Bell Telephone Company of Canada is governed by a board of eight directors, among whom are included the following gentlemen:

C. F. Sise, president (who came from Boston to organize the company in the interests of the owners of the United States patents).

F. P. Fish, president of the American Telephone and Telegraph Company, the controlling Bell Company of United States.

W. S. Driver, treasurer of the American Telephone and Telegraph Company.

Thomas Sherwin, auditor of the American Telephone and Telegraph Company.

The remaining directors are: Hon. R. MacKay, Robert Archer, Hugh Paton and Charles Cassils, all of Montreal.

It is not difficult to form an opinion as to which members of this directorate exert the greatest influence upon the company's policy; four gentlemen, skilled in the manipulation of the telephone business, three of whom are executive officers of one of the most unscrupulous monopolies the world has ever known; or four Montreal gentlemen whose knowledge of the telephone business must of necessity be extremely limited.

We do not doubt the company's statement as to the proportion of shareholders in Canada and the United States, but will that corporation take the public a little further into its confidence by stating the total amounts respectively of the holdings of those shareholders residing in Canada and those residing outside? As it is the number of shares held and not the number of share holders which secures the controlling power, it is more than probable that the 104 non-resident stockholders own a much greater proportion of the company's stock than the 51 per cent. necessary for foreign control.

The list of stockholders produced by the company at the Dominion telephone inquiry shows that on December 31, 1904, out of a total capitalization of \$7,916,960, one of the 104 non-resident shareholders, viz., the American Telephone and Telegraph Company, held \$3,083,300, leaving the comparatively small balance, required to secure foreign control, of \$375,180, or an average holding for each of the remaining 103 non-resident stockholders, several of whom are wealthy American financiers, of \$8,500. Since 1881 the American Bell Telephone Company and its successor, the American Telephone and Telegraph Company, have received in dividends from the Bell Company of Canada, out of the profits provided by Canadian telephone users, over \$2,000,000.

In the face of these facts, will the people of Manitoba continue to contribute their quota of dividends to an over-capitalized corporation whose policy is largely influenced, if not absolutely controlled in New York, or will they decide, before it is too late, to build and operate a telephone service which will only require to earn a net revenue of 4 per cent. on a capitalization not exceeding \$100 per subscriber, instead of 8 per cent. on the company's present capital expenditure of over \$159 per telephone?

## LONG DISTANCE RATES IN MANITOBA

The Bell Telephone Company of Canada at the present time is making extraordinary efforts to cover this province with long-distance lines, with the object of creating an impression upon public opinion, before any vote is taken by the municipalities upon the government's telephone policy, that there is no necessity for a provincially-owned telephone service. In this connection we might call attention to the recent action of the Rapid City board of trade, which at its last meeting resolved to approach the Bell Telephone Company with the request for the adoption of long distance rates similar to those in operation in Ontario. We would recommend the board of trade of Rapid City to concentrate its efforts in the direction of securing a telephone system owned and operated by the people and giving service at cost as the only remedy for the present high rates, both local and long distance.

While the Bell Telephone Company has made an unfair discrimination in long distance rates against telephone users in this province, the rates in Ontario are not such as the people of Manitoba should be satisfied with. High as these rates are in Ontario, however, anyone making a careful study of the Bell long distance charges in Manitoba will be impressed with the fact that, if we except the Yukon territory and South Africa, they are the highest in the world. For speaking fifty miles the average charge is one cent per mile for a three-minute conversation; between 50 and 100 miles the rate is three-quarter cent per mile. For distances over 100 miles the company has resorted to a trick by which it is intended to convey to the unwary the impression that the rates compare favorably with those in other parts of Canada. We refer to the two-minute period, which is an altogether insufficient time for the average telephone conversation. We venture to assert that not one person in fifty can complete a conversation without exceeding the two-minute limit. This being the case, the only fair basis for comparison is the cost of a three-minute talk.

The three-minute rate from Winnipeg to Elgin, a distance of 168 miles, is \$1.05. For 175 miles the charge in Ontario and Quebec is 90c; in Russia 52c; in Great Britain 49c; in Italy 40c; in Norway 27c; in Germany 25c; in France 20c; and in Sweden 13c. In the last seven countries, where the long distance lines are owned and operated by the government, we could give many instances of even lower rates, as for instance in Germany, where you can speak over 500 miles for 37c, but to confine ourselves to the Bell charges, there is certainly no justification for exacting higher tolls from the people of Manitoba than are paid by telephone users in the eastern provinces. We might well ask, why we in Winnipeg should pay 75c for three minutes' conversation with Neepawa, when the rate between Ottawa and Montreal, the same distance, is only 50c. Such unfair discrimination affords ample indication of the unscrupulous treatment which the people of this province may expect should the company ever find itself in possession of an absolute monopoly of the long distance service here.

It is up to the people to decide whether they will continue to pay the present extortionate rates charged by the Bell Telephone Company, or if they will adopt the government's policy of building and operating a complete and up-to-date system giving service at a cost which will compare favorably with the rates existing in the European countries we have named.

## BELL TELEPHONE TACTICS.

Anyone who has followed closely the history of the Bell Telephone Company for the past few years cannot fail to notice the many and varied methods adopted by that corporation in its efforts to blindfold and mislead the public. Wherever it has been possible, it has never failed to take advantage of local conditions by employing certain conflicting elements, either in political or municipal life, to do the fighting with weapons and ammunition supplied by "Bell" emissaries, while that corporation has concealed its hand and remained in the background.

The latest method adopted by this company is an attempt to introduce a political issue in connection with the vote to be taken at the next municipal elections upon the question of public ownership of the telephone service. An article, anonymous as usual, appeared in Manitoba Free Press of Sept. 29th, which compensated its readers for what it lacked in logical argument by the liberal amount of space which it occupied. We have not the least doubt that if this criticism of the recent telephone legislation could be traced to its source, it would be found to be the work of one of the legal retainers of the Bell Telephone Company.

Whether this supposition is correct or not, the Free Press

may as well remember that the telephone question is not, and never can be made, a political issue; and any party that allows itself to be persuaded that this important problem can be settled on party lines, is forging a weapon which sooner or later will be turned against itself.

The only two factors in this question are, the people and the Bell Telephone Company, and it is useless to disguise the fact that those who seek to place difficulties in the way of the people securing their own telephone service at cost, are the enemies of the people, and are working solely in the interests of the monopoly. In plain language, the Bell Telephone company knows that its one chance of salvation from an overwhelming vote in favor of public ownership of the Manitoba telephone service lies in a "forlorn hope" of creating a political faction by raising the issue of federal versus provincial and municipal ownership of the telephone service. The company is equally opposed to both of these policies and cannot openly support either of them, therefore it employs the Liberal press to oppose the provincial legislation by holding out the probability of the Dominion government nationalizing the whole telephone service of Canada.

The Free Press knows that the chances of the Dominion parliament, as at present constituted, nationalizing the telephone service are just about as remote as annexation with the United States. The recent telephone enquiry at Ottawa brought out the fact that there are too many senators and members interested in the welfare of the Bell Telephone Company to justify the hope that any effective legislation will ever be placed upon the statute books of the Dominion which will weaken the monopoly enjoyed by that corporation and the provincial companies in which it has a stockholding interest.

The late postmaster-general, Sir William Mulock, was undoubtedly the strongest man who ever held office in the Laurier administration, and had the reputation of making a success of everything he took in hand. In response to the universal demand of the public for relief, he took up the telephone question as a champion of the people against an arrogant and aggressive monopoly, only to find himself deserted by his government, with the result that his retirement and the appointment of the Bell Telephone Company's leading counsel as his successor speedily obliterated the cherished hopes of the people, who had been foolish enough to believe that their rights were more important than the vested interests of a semi-foreign monopolistic corporation with an unlimited treasury at its command for lobbying purposes.

The federal government has, with no uncertain sound, rejected the demand of the people for nationalization of the long distance telephone service, and has declared that it prefers to control the present company. This policy secures to the Bell Telephone Company absolute immunity from interference with its so-called vested rights, and perfect freedom to continue its past policy of arrogance and extortion in so far as it is not restrained by competition.

The people of Manitoba are intelligent enough to resent any attempt, on the part of the Liberal press and the Bell Telephone Company, to throw dust in their eyes by suggesting that the Dominion government may revoke its telephone policy of last session and enact more remedial legislation than that of the provincial government.

The position in Manitoba is briefly this:

There is a present population of 360,000 people, with about 6,500 telephones, or one telephone to each 55 inhabitants. Not including the "Bell" telephones, the state of Iowa has one "Independent" telephone to each 12 inhabitants. Five years hence this province will probably have 1,000,000 inhabitants, and allowing for the same development at that of the Independent companies in Iowa there will, in the next five years, be a demand for 80,000 telephones. Who is going to supply this demand? A monopolistic corporation which has proved itself incapable of developing the rural districts and whose base of operations is 1,500 miles away; or the citizens of this province through their legislative and municipal councils?

The provincial government is ready to provide the long distance service at cost; whereas at the present time the people are, with one of two exceptions, paying the highest rates in the world. Before doing this, however, the government has provided that the people shall say whether they are desirous of a continuance of the present conditions, or if they are willing to confer upon the municipal councils elected by themselves authority to co-operate with the government by building and operating the local exchanges, and so obtaining a service at rates averaging one-half the present charges. In the event of the people choosing the latter alternative, it will be left to each individual municipal council to take whatever further steps may be in the best interests of the ratepayers whom they represent.



The municipal councils are perfectly capable of carrying into effect the wishes of the people they represent, and the Bell Telephone Company and its supporters need have no anxiety that any council will force upon an unwilling municipality a publicly owned telephone system.

The people are asked by the government to decide this question for themselves and they will record their vote for whichever policy they consider to be for their own interests. If the Bell Telephone Company are able to convince the people of Manitoba that its policy is better than public ownership, by all means let it do so, but it will only intensify the chances of its own defeat by any attempt to make it a political issue.

### THE MANITOBA FREE PRESS AND THE TELEPHONES.

The Manitoba Free Press in a further effort to make political capital out of the provincial telephone legislation, quotes a passage from the speech of the attorney-general in the legislative assembly at the introduction of the government's telephone bills. The passage in question is nothing more than a statement of fact and there is not a line in it to justify the assertion that the action of the provincial government, in calling upon the people to express their desires in regard to private or public ownership of the telephone service, is one of political partisanship.

So far as the connection of the provincial government with the policy of giving the people every facility to build and operate their own telephone service is concerned, any school boy knows that whatever reforms are enacted by legislation they must of necessity be credited to the political party which happens to be in office at the time such reforms were placed upon the statute books. It does not necessarily follow that all reforms introduced by a government justify the creation of a party issue. What are the facts in this case? The question of public ownership of the telephone service in Canada became a live issue when Sir William Mulock, acting on behalf of the Laurier administration, secured the appointment of the select committee on telephone systems, to inquire into telephone conditions in Canada, and elsewhere. The hopes of the people in this direction were raised at that time by the action of the Dominion government, only to be dashed to the ground at a later date.

Had the Dominion government taken that action which was justified by the evidence produced at the telephone inquiry, they would have acceded to the universal request of the people of Canada, and set about to nationalize the long distance telephone service. Had they done this, the Roblin government would not have begrudged the Dominion parliament all the credit which would have been due to them for acceding to the expressed will of the people. The Dominion government decided, however, that the interests of the Bell Telephone Company were more important than the will of the people, and as a result of this, the telephone question was transferred from the federal government to the various provincial governments.

A municipal act has been passed by the Ontario legislature and an important charter has also been given to a company to build independent long distance lines, in competition with the "Bell," in that province. The Alberta government has also adopted the policy of a publicly owned system, and because Manitoba is also dealing with this question which has been thrust upon the provinces by the inaction of the federal government, it is accused of doing so in the selfish interests of its own party. No intelligent unprejudiced person will believe such an assertion. The truth is that the Bell Telephone Company is using the Liberal press to convert the telephone question into a party cry, because it knows that with a vote on the straight issue of private monopoly versus public ownership it is already hopelessly defeated.

As the Free Press quotes the attorney-general in proof of the allegation that the government's action in regard to the telephone question is a partisan one, we give the following extracts from the speech of that gentleman made at the annual convention of the Canadian Independent Telephone association in Toronto last month:

"It was my pleasure a little over a year ago to preside upon a commission of the Manitoba Legislative assembly composed of both sides of the house, Liberals and Conservatives. The leader of the Opposition was upon that commission. We spent a considerable time in its investigation, and I wish to say this at the outset that the movement in Manitoba is not a political movement in the ordinary sense that 'political' is used, but it is a movement necessitated by the conditions and by the belief of our province of the great benefit that will result to the province if we accomplish it. Now, sir, that commission, composed as I have said of both sides of the house, never had a

division. We came to a unanimous conclusion upon the committee and we came to a unanimous conclusion in the house. There was not one dissenting voice, either upon the committee or in the house, upon the conclusions we arrived at, and that was that the long distance lines should be owned by the government, and that, as far as possible, the municipalities should own and control the local exchanges, the government giving, as we believe it is our duty to give, an inter-communication between the exchanges that will enable them to operate them successfully, and by so doing remove one of the greatest obstacles, I believe, in the advancement of telephone interests; that is to say, the local exchanges are handicapped by reason of not having that long distance communication which is essential to their satisfactorily working out.

"So, sir, we resolved upon this policy, a policy of government ownership of long distance lines and municipal ownership in so far as local lines are concerned. And the government has made this offer to the municipalities: We have said we are willing to construct and will construct the long distance lines, but we ask you to submit to the people of the province at the municipal election, which will be held in December next, a simple question, whether or not you desire to have your local systems owned by your municipalities? If the result of that vote is favorable, and the government engineer or expert finds that there are sufficient people desirous of having the use of the telephone in the province or in the municipality, we will, as a government, endorse your bonds so that you may be able to get your credit for that purpose at as low a rate as possible.

"Now, sir, we submit this question to the people of the province apart from any politics; we submit it as a municipal question, and we will await the result of that appeal, I think, with confidence and with assurance; because this is the first time, and we are the first province to give to the people the right to say whether or not they desire to have their telephones owned by themselves, operated by themselves, in their own interests. We did this because, as I said at the outset, we desired this to be dis-associated as far as possible from politics, because our opponents are very astute and they would endeavor, if possibly the chance were given, and we have seen indications of it, to try to get the question mixed up in some way or other in a political turmoil; and I think that everyone here present will agree with me that it is most undesirable that there should be any politics connected with the movement. It is a movement, not in politics, but for the interests of the people."

We leave the public to decide whether the straightforward utterances of the attorney-general, or the action of the Free Press in attacking the legislation, passed in fulfillment of the request of the people voiced through the Union of Manitoba Municipalities, savors most of political partisanship. As we see it, the fight is a straight issue between the Bell Telephone Company and the people, who will decide the question in their own interests, and not those of any political party.

### HOW TO GET CHEAPER 'PHONES.

We in Ontario sometimes pride ourselves on being the leaders in progress and reforms in this country. Ontario people have been talking for some time about government ownership of public utilities; but, while we have been talking, Manitoba is acting, notably in the matter of government control of the telephone service. Mr. F. Dagger, a telephone expert with twenty-five years experience, has been retained by the Manitoba government in an advisory capacity, and to put into effect the policy of government ownership.

Mr. Dagger has stated that, "with few exceptions, there is no reason why every farmer in Manitoba should not have a telephone for one dollar a month, but no company looking for large dividends and an enormous surplus would furnish these at that figure; therefore, it is in the people's interest to support the government's policy."

What is applicable or practicable in this regard in Manitoba should be applicable and practicable in Ontario, and there is not the least reason why every farmer in Ontario should not also have his phone at a cost of one dollar a month. We cannot do better than follow the lead set us by Manitoba in this matter. The thing to do is for Ontario to engage the services of an expert like Mr. Dagger, and to do it now. This is either a good thing to do, or it is not. It is either in the interest of the people or it is not, and no sane man will say it is not in the interest of the people. If it is a good thing to do in the interest of the people, why postpone doing it?

Premier Whitney could not pursue a wiser course in this matter, nor do the public, who have suffered long at the hands of the Bell Telephone monopoly, a better turn than to take a

plebiscite on this question of provincial and municipal ownership and control of lines in Ontario. The time is ripe for action. Everything is to be gained and nothing lost by this course. Strike while the iron of public sentiment is hot.

While on the subject of government ownership of telephones, it might be in order to ask where are the Liberal journals that have been making such a howl about governmental ownership of public utilities? Now is the time for them to talk out loud. Perhaps theirs was only an academic campaign; but if they mean what they have been saying, now is the time for them to urge such a campaign as we have suggested upon the Ontario government.—*Toronto World*.

## EXPENSIVE 'PHONES MUST BE ABOLISHED

F. Dagger, the telephone expert employed by the Manitoba government, arrived in Winnipeg last evening from Toronto. Mr. Dagger, on being interviewed by a representative of *The Telegram* at the Empire hotel, where he is registered, spoke interestingly of the telephone situation in Manitoba and also highly recommended the initiative being taken by the present government in advocating the control by public ownership of the systems in this province. Mr. Dagger is qualified to speak authoritatively on this matter, as his experience has extended over a period of 25 years, 18 of which were devoted to conditions prevailing in Great Britain, more particularly in regard to government and municipal ownership and competition.

He was the expert employed by the present Dominion government of 1906 to investigate the telephone systems of Canada with a view to acquiring and operating them as government property. Sir William Mullock was chairman of this commission.

### TO TAKE A PLEBISCITE

"The Manitoba government is, in December next, I understand, to take a plebiscite on the question of provincial and municipal ownership and control of lines in the province. The Manitoba government have engaged my services to advise them and to educate them along the lines of the public ownership of the telephone service, they to decide what form this education will take. The history of the Bell Telephone companies both in the United States and in Canada demonstrates without the possibility of contradiction that they have hitherto failed to supply a service adequate to the needs of the people, and such services as have been supplied have been at rates almost prohibitive until competition entered the field. Eleven years ago, when the Bell telephone patents expired, there were less than 300,000 telephone subscribers in the United States and Canada, the telephone being at that time a luxury for the few.

### NEW REGIME INITIATED

"With the expiration of the patents in the United States commenced the establishment of a telephone service by means of local competition, the capital in the majority of instances being provided by the telephone users and their friends. Today there are in the United States over 3,000,000 independent telephones, representing a capital of nearly \$300,000,000.

"This immense business has been built up since 1895 in the face of the most aggressive opposition that has ever been witnessed in any commercial movement. The independents today have 1,000,000 telephones in excess of the Bell system, the figures of the latter including many thousands of slot machine instruments and free telephones.

"In Canada, while the Independent movement was only organized last fall, the increase in the number of independent telephones during the past twelve months has been 50 per cent of that of the Bell Telephone Company of Canada for the year 1905. The success of the independent movement in the United States is to be attributed to the fact that the systems are owned and controlled by local stockholders, who are themselves users, and, therefore, see to it that they get the best service at a reasonable cost.

### BUT ONE OPINION

"In Manitoba there can be but one opinion and that is if the people are to be provided with an adequate telephone service covering the whole province at the lowest cost it can be done by the establishment of a provincially owned long-distance system and publicly owned and controlled local exchanges. Such a policy is the only guarantee for a permanently cheap and good service.

"The energetic action of the Bell Telephone Company of the present time is only an effort on its part to retain undisputed possession of the field, and should it attain this end, the people will undoubtedly suffer and have to pay in the long run for the enormous outlay which that company is making at the present time.

### VALUABLE TO MANITOBA FARMERS

"Manitoba being a farming country, the telephone service is a matter of very great importance in rural districts, not only for the purpose of removing the isolation which is a part of the farmer's home life, but places him on an equality with his city brethren in the matter of facilities for doing business.

"The Bell Telephone Company has at no time in its history evinced the least desire to furnish the farmer with telephone service; on the contrary, they have always met applications for rural service with prohibitive terms and the small amount of rural business which that company does do is due to its efforts to destroy local competition and to ruin those systems which the farmers have established themselves. At the Dominion telephone enquiry the Bell telephone officials admitted that they had only one rural phone to 1,250 of the rural population of the territory they served.

### GOOD 'PHONES FOR ALL

"A very large population of the independent telephone business in the United States has been furnished by the farmers themselves, in many districts there being a telephone in every farm house, while before the advent of the independent movement such a thing was unknown. It has been found by experience that rural systems are responsible for the marvelous growth of the exchanges in the towns and cities of the United States and that the systems have exerted a large influence in the business prosperity of the centre where these rural lines radiate from."—*Winnipeg Telegram*, September 12, 1906.

## MAYOR FLEMING IS UNWILLING FACTOR

The *Manitoba Free Press* printed the following communication from Brandon, which is self-explanatory, and is supposed to represent the views of Mayor Fleming, president of the Manitoba Union of Municipalities, on the government's telephone policy. In it are given letters which passed between F. Dagger, provincial government telephone expert, and the mayor, which are followed by Mr. Fleming's expression of opinion on the question.

BRANDON, Man., Sept. 26.—Mayor Fleming's attention was this morning drawn to the article appearing in *The Telegram* of last evening in connection with the proposed convention of municipal delegates to discuss the telephone legislation. Mr. Fleming said he had received a communication from Mr. Dagger, the telephone expert employed by the provincial government asking him as president of the Manitoba Union of Municipalities to call a convention here during October. Mr. Fleming replied, stating that he must first secure the consent of the executive before calling the convention. The following is a copy of the correspondence:

Winnipeg, Sept. 20.

J. W. Fleming, Mayor of Brandon, Man.

Sir.—It is proposed by the government at an early date to extend an invitation to the Union of Manitoba Municipalities to attend a convention to be held at some convenient point in the province, for the purpose of discussing the recent telephone legislation, having more particularly regard to the municipal vote to be taken on or before the next elections. The government is prepared to defray all expenses in connection with this convention, including the traveling expenses of the delegates, as it is desired to have as representative a meeting as possible, in order that all municipalities may have an opportunity of obtaining full and complete information regarding the question of public ownership of the telephone service. I shall be glad if you will kindly write me your suggestions as to the best means of calling the members of your union together, and the most suitable time and place for holding the convention. I may say that it has been suggested to hold it in Brandon in October.

Yours very truly,

F. DAGGER,  
Provincial Telephone Expert.

Brandon, Sept. 24.

Mr. F. Dagger, Provincial Telephone Expert, Winnipeg.

Sir.—I am in receipt of your letter of the 20th extending an invitation to the Union of Manitoba Municipalities to attend a convention to discuss the recent telephone legislation. It is very hard for me to say when it will be possible to have such a convention. It would be necessary for me to consult the rest of the executive committee before doing so. I am afraid that it would be very difficult to get a convention together during October, as the majority of the members are farmers, and will be

busy on their farms, and and also because the regular convention takes place in November. However, if you still think it possible to have one during October I will call a meeting of the executive to consider the matter.

Yours respectfully,  
J. W. FLEMING.

#### MAYOR FLEMING'S OPINION

Mayor Fleming was asked: "What do you as a municipal officer think of the government's telephone policy?" and in reply said:

"There is no doubt the people of Manitoba are in favor of a cheaper and more extended telephone service, and I believe a system of municipal and government owned telephones, if worked upon proper lines, to be the ideal one, but whether the present government legislation, in so far as they have enacted it, is upon proper lines is open to question, and in my opinion it is vicious in the extreme."

Hon. Colin H. Campbell, attorney-general of Manitoba, when spoken to about the matter, said: "In reply to Mayor Fleming's statements, I must say that I cannot understand what he means by stating that he is in favor of municipally-owned telephone systems and then stating immediately afterwards that the telephone policy of the provincial government is 'vicious in the extreme.' Inasmuch as the legislation was passed at the request of the municipal unions and was endorsed by municipal unions throughout Canada, it is hard to see what he means by such statements. His statements are very inexplicit. Mayor Fleming does not state whether he is expressing his own sentiment or that of the municipal union, and his letter does not indicate any great anxiety to have a convention of municipal officials to discuss the matter."—*Winnipeg Telegram*.

#### MAYOR FLEMING'S 'PHONE OPPOSITION

"Brandon gave the Bell Telephone Company a five years' franchise at the same time that the provincial government brought up this telephone legislation, and that was chiefly owing to Mayor Fleming's influence," said F. Dagger, when asked why, in his opinion, the mayor of the Wheat City should manifest such an opposition to the government's telephone policy. "It is apparent," he continued, "that the *Free Press* and Mayor Fleming are acting in collusion with the Bell Telephone Company, in opposing public ownership of the telephone service. It is obvious that the same influences, which induced Mayor Fleming to support the granting of a five years' franchise to the Bell company, are responsible for the anti-public ownership campaign. In other words, 'the man behind the gun' is the Bell Telephone Company."

#### MR. DAGGER WRITES REPLY

The following is a copy of the letter written in reply to Mayor Fleming's letter of Sept. 24, in which he discouraged the idea of a conference of municipal officials to discuss telephone matters. It is also pointed out that Mayor Fleming, in an interview with the Brandon correspondent of the *Free Press*, characterized the policy of the government as extremely vicious and this interview, together with Mr. Dagger's letter to Mr. Fleming, and Mr. Fleming's reply, were published in that paper, and were republished in *The Telegram* with a reply by Hon. Colin H. Campbell, attorney-general. The letter follows:

"I have to thank you for your letter of the 24th inst., in regard to the proposed meeting of the Union of Manitoba Municipalities to discuss the telephone question. In reply thereto, I may say that I appreciate the fact that the farmers may be too busy in the early part of next month to attend the convention, but in my opinion, which is confirmed by several members of the executive with whom I have been in communication, the latter end of the month would meet the convenience of all concerned.

"I am aware of the fact that the regular convention takes place in November, but I would venture to point out that a discussion of the telephone question would encroach upon the time of that meeting at the expense of other subjects which would require to be taken up at that time.

"Under these circumstances I would ask that you give this matter further consideration, and advise me of your wishes."

#### MAYOR FLEMING'S REPLY

In reply to the above letter from Mr. Dagger, Mayor Fleming wrote:

"I have your letter of the 26th before me. Your asking to have the convention late in October seems to me to somewhat complicate matters, as it will be impossible to get delegates to attend that, and then get them again so soon after to the annual convention in November. I am of the opinion that if it be early enough about the 15th or from then to the 25th of No-

vember, that it would be better to have the discussion come up at the annual convention. However, I have written the secretary of our union to call a meeting of the executive committee in Winnipeg for the second week in October, and shall be very glad to have you present at that meeting to discuss the situation."

#### OUTLINES THE POLICY

Under date of Sept. 29, Mr. Dagger replied to this last letter as follows: This letter will be found interesting as it outlines the government's telephone policy and explains why it was undertaken.

"I am in receipt of your favor of the 27th inst., and in reply thereto beg to say that a meeting of the executive of your union upon the 15th of next month would not admit of sufficient time being given to the municipalities to appoint delegates to attend a convention in the same month.

"I may say that it is desired at the proposed conference that every facility shall be afforded to the delegates for a complete and thorough discussion of the government's telephone policy, and it is obvious that at the annual meeting of the union, when many other subjects are to be deliberated upon, the limited time at the disposal of the convention would not admit of adequate consideration being given to the telephone question.

#### AT MUNICIPALITIES REQUEST

"I would point out that the legislation passed at the last session of the provincial legislature was in pursuance of the request of the municipalities made in the form of resolutions passed at the conventions of the Union of Canadian Municipalities and also the Union of Manitoba Municipalities, held last year, and following along these lines when the government decided to convene a special meeting of the municipalities to consider this question, it was felt that you as president of the Manitoba union would readily acquiesce in the calling of such special meeting for the purpose of affording the members of your union an opportunity of conferring with each other and stating their views upon this important question. Moreover, as the government is prepared to pay the cost of holding this convention, including the traveling expenses of the delegates, I do not see why it should have any effect upon the attendance at the regular annual convention of your union.

"It is, however, very important that such a meeting should take place not later than Oct. 31, in order that the people in each municipal district should be afforded sufficient time to obtain the necessary information on the subject before the date of the municipal elections.

"I would, therefore, ask that a meeting of your executive be called at the earliest possible date, and I would further suggest that the members of the special telephone committee, appointed by resolution No. 8, at the last convention of the Manitoba union, be also invited to attend with your executive on that occasion."

#### New Lock-Out Device.

A Kansas inventor is said to have perfected a selective ringer and lockout device which does the work. The inventor, whose name is H. D. Williams, says that the device is very simple. He does not step up by mechanical means, but by electric power. He does not chance any of the circuits that are now in the telephone, but locks out by locking the switchboard. He has an electric magnet and armature that control the lockout, one magnet with an adjustable armature on each side and a busy signal working on the side of the coil. The busy signal and one of the armatures are polarized. The busy signal is thrown on by central and off by the alternating generator. Central has complete control of the line all the time. No one can get in on the line unless the operator unlocks the phone.

The selector is operated by power from central, but the lock and bell are controlled by the two cells of battery that are now in each phone. It works on either a ground or metallic circuit and the consumption of power is very light as it is used only as long as it takes it to ring and that is done as quickly as a call is made on private lines.

The power is applied by push buttons, one for each phone, on the longest line say from 10 to 12. The lightest power calls No. 1 and 2; ten volts more call 3 and 4; ten more 5 and 6 and so on. One armature on the number called closes a circuit from the local batteries and rings bell and unlocks switch hook at the same time.

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


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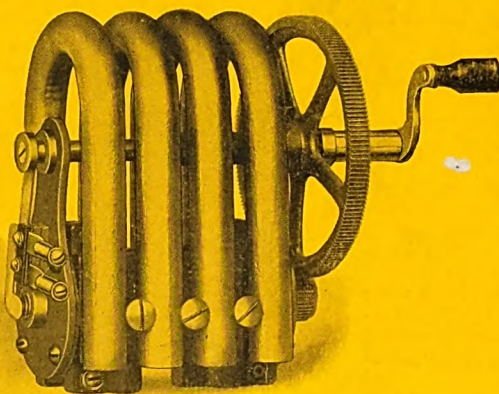
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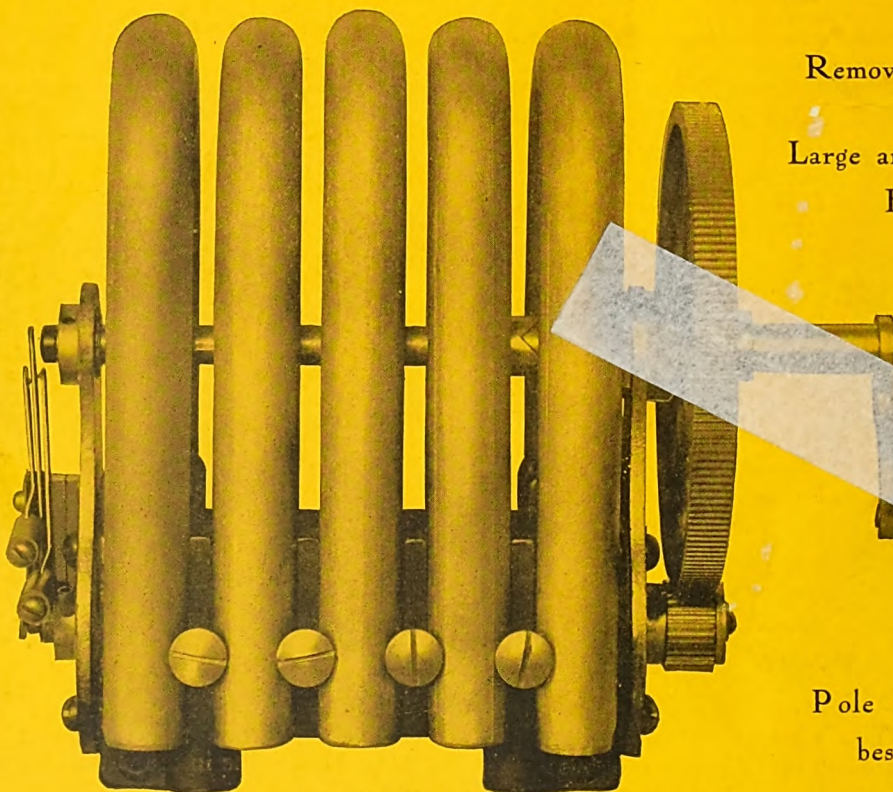
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